# BRIEFING DOCUMENT
# FOR
# STATE SOIL AND WATER
# CONSERVATION BOARD MEMBERS

## *Bacteria TMDL Task Force*

Preparation for a
June 29, 2007 Joint Meeting
Between

## TEXAS STATE SOIL AND WATER CONSERVATION BOARD
## &
## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

The Texas State Soil and Water Conservation Board (TSSWCB) and the Texas Commission on Environmental Quality (TCEQ) conducted a joint meeting on September 27, 2006, on the status of inter-agency cooperation regarding the development and implementation of nonpoint source prevention and abatement projects to restore and protect water quality, and specifically bacteria Total Maximum Daily Loads (TMDLs).

The outcomes of that meeting included the reauthorization of the *Memorandum of Agreement between the TCEQ and the TSSWCB regarding TMDLs, Implementation Plans, and Watershed Protection Plans* (WPPs). The Board and the Commission also established a joint technical Task Force on Bacteria TMDLs.

This purpose of this meeting is to consider the Task Force Report and to take action on the development and implementation of bacteria TMDLs. This meeting will be webcast live. Four of the seven Task Force members are expected to be in attendance.

<u>MOA on TMDLs and TSSWCB TMDL Program</u>

The new MOA describes the programmatic mechanisms the agencies will employ to develop and implement TMDLs and WPPs. It essentially reemphasizes the role of TSSWCB in TMDLs in general, but also includes new language regarding WPPs, which are a required component for certain federal Clean Water Act §319(h) grant expenditures. The MOA is attached. Since the new MOA was authorized, staff from the TSSWCB and TCEQ have conducted two coordination meetings on October 31, 2006 and March 29, 2007. A third meeting is scheduled for July 10, 2007. These meetings have demonstrated cooperation between staff from TCEQ (TMDL Team, 319-NPS Team, and Assessment Team) and TSSWCB. Summaries from the first two meetings are attached and have been presented to the Board at earlier meetings.

As part of the MOA coordination effort, TSSWCB staff developed a list of TMDLs with varying degrees of prioritization with respect to agricultural and silvicultural nonpoint source pollution. High-priority TMDLs are those TMDLs staff intends to bring before the Board for approval. Low-priority TMDLs are those TMDLs that staff continues involvement with but, at this time, does not intend to bring before the Board for approval. This list is attached.

TSSWCB is committed to funding and collaborating with TCEQ on TMDL projects encompassing monitoring, assessment, modeling, planning, education and implementation. TSSWCB TMDL projects are funded through federal Clean Water Act §319(h) grants and appropriations from the Texas Legislature. Attached is a list of TSSWCB-funded projects that bear on the development and implementation of TMDLs (bacteria and other).

In response to concerns regarding the TSSWCB's lack of involvement with on-going TMDLs (expressed by agricultural producers and rural landowners at TMDL stakeholder meetings) the TSSWCB included an exceptional appropriation request of $3,124,100 and two FTEs in its Fiscal Year 2008-2009 legislative appropriation request. This exceptional request was fully funded by the 80th Texas Legislature.

On May 24, 2007, the Board approved the *TSSWCB Policy on Total Maximum Daily Loads*. A copy of this policy is attached.

Task Force on Bacteria TMDLs

The Board and Commission charged the Bacteria TMDL Task Force with:

- examining approaches other states use to develop and implement bacteria TMDLs,
- making recommendations on cost-effective and time-efficient methods for developing TMDLs,
- making recommendations on effective approaches for developing Implementation Plans,
- evaluating the variety of models and BST methods available for developing TMDLs and Implementation Plans and recommending under what conditions certain methods are more appropriate, and
- developing a roadmap for further scientific research needed to reduce uncertainty in what we know about how bacteria behave under different water conditions in Texas.

Appointed members of the Task Force include:

- Dr. Allan Jones, Texas Water Resources Institute (chair)
- Dr. George DiGiovanni, Texas Agricultural Experiment Station–El Paso (BST)
- Dr. Larry Hauck, Texas Institute for Applied Environmental Research (R&D)
- Dr. Joanna Mott, Texas A&M University–Corpus Christi (BST)
- Dr. Hanadi Rifai, University of Houston (models)
- Dr. Raghavan Srinivasan, Texas A&M University (models)
- Dr. George Ward, University of Texas at Austin (R&D)

The Task Force was given 120 days to complete their assessment and report back to the Commission and Board. The Task Force held three meetings/teleconferences (October 24, 2006,

November 27, 2006, and December 18, 2006) to develop their recommendations (one meeting each hosted at TWRI, TCEQ and TSSWCB). Drafts of the report were shared via e-mail. All Task Force materials, including background resource materials, summaries of meetings, all drafts of the Report, and all comments received on the Report, are available at http://twri.tamu.edu/bacteriatmdl/. Approximately 50 "Expert Advisors" with expertise on bacteria related issues had significant opportunity to provide input and guidance to the Task Force during the process. A list of Expert Advisors is attached and includes non-governmental organizations and local, state, and federal agencies. The 3rd draft of the Report was delivered to the Board and Commission via e-mail on January 25, 2007, precisely 120 days. A 4th, and final, draft correcting inconsistencies in the Executive Summary and the body of the Report was published on June 4, 2007. Excerpts from the 4th draft of the Report are attached.

On February 14, 2007, Texas Farm Bureau hosted a meeting with agricultural industry organizations in Austin to receive an update on the Bacteria TMDL Task Force Report from TWRI. Jerry Nichols, Larry Jacobs, John Foster, TJ Helton and Aaron Wendt attended this meeting.

The May 2007 issue of *The Cattleman*, published by Texas and Southwestern Cattle Raisers Association, included an article on the Bacteria TMDL Task Force.

Summary of Report

The Bacteria Fate and Transport Models section is not intended to be a comprehensive review of models. Rather it briefly characterizes a few frequently used models. Table 1, on page 22 of the Report, is a matrix describing the various characteristics of the models discussed. The Task Force recommends the use of Load Duration Curves and spatially explicit analyses to develop most bacteria TMDLs. Under certain limited situations, the Task Force recognizes the need to utilize sophisticated modeling for bacteria TMDL development.

The Bacterial Source Tracking section describes the strengths and weaknesses of several BST tools used in Texas. Table 2, on page 29 of the Report, is a relative comparison of several BST techniques. This section generally follows the recommendations from the TSSWCB Clean Water Act §319(h) funded BST project for Lakes Waco and Belton. The Task Force recommends the use of a composite of 2 different library dependent BST methods. Three combinations are recommended based on cost and method sophistication. The Task Force notes that in nearly all cases, no single BST method should be solely relied upon. The Task Force also recommends the continued development and use of library independent BST methods. The Task Force recommends work to continue to refine, modify and improve the Texas BST Known Source Library started with the TSSWCB Lake Waco BST project and the TCEQ San Antonio BST project. It is recommended that agencies use contractors that use BST methods that will strengthen and expand the current Texas library and follow previously approved quality assurance and quality control standard operating procedures for performing analyses.

The Recommended Approach for Bacteria TMDL and Implementation Plan Development section is the heart of the Report. Figure 5, on page 38 of the Report, describes the recommended Three-Tier Approach. The Approach is designed to be accountable to watershed

stakeholders, cost-effective, time-efficient and scientifically credible. Tier 1 is described as the minimum level of analysis and should be required for all bacteria TMDLs. Tier 2 provides more in-depth and extensive assessment and is anticipated to provide sufficient content to develop most bacteria TMDLs. Tier 3 is described as being limited to Implementation Plan development and being used for TMDL development only if one of the following apply: (1) TMDLs with large bacteria reductions >75%, (2) TMDLs with highly uncertain and conflicting results, (3) large implementation costs, or (4) TMDLs that haven't obtained stakeholder acceptance.

The Research and Development (R&D) Needs section lays out an extensive R&D roadmap to quantify and reduce uncertainties in bacteria fate and transport modeling and BST in Texas. Many of these research needs characterize stakeholders' trepidation with current draft TMDLs (like sediment interactions, re-growth and die-off, and BMP efficiency).

TCEQ Activity relating to Bacteria TMDLs and Task Force

TCEQ is currently reviewing Texas Water Quality Standards for the 2006 Triennial Review process. Changes to the bacteria standards are being considered among many other changes. A public advisory group has been established to provide input into this process. On May 16, 2007, Aaron Wendt and Donna Long attended this TCEQ Surface Water Quality Standards Advisory Work Group meeting in Austin. This meeting centered on provisions of the standards related to bacteria. A summary of this meeting is attached. TCEQ adoption of any changes to the standards is not expected until at least September 2008. EPA must also approve any changes thereafter.

Numerous bacteria TMDLs have been released for public comment by the TCEQ.

- *One TMDL for Bacteria in Gilleland Creek, Segment 1428C* (comment period closed March 12, 2007)
- *One TMDL for Bacteria in Upper Oyster Creek, Segment 1245* (comment period closed March 26, 2007)
- *Seventeen TMDLs for Bacteria, Dissolved Oxygen, and pH in Adams Bayou, Cow Bayou, and Their Tributaries* (comment period closed April 9, 2007)
- *Three TMDLs for Bacteria in the San Antonio Area, Segments 1910, 1910A, and 1911* (comment period closed April 23, 2007)
- *One TMDL for Bacteria in the Guadalupe River Above Canyon Lake, Segment 1806* (comment period closed April 23, 2007)
- *One TMDL for Bacteria in Oso Bay* (comment period closed June 15, 2007)

At their June 13, 2007 regularly scheduled meeting, the TCEQ considered the adoption of the Gilleland Creek, Upper Oyster Creek, and Adams and Cow Bayous bacteria TMDLs. Noting continuing stakeholder concerns with the TMDL documents and the scheduled June 29, 2007 joint meeting with the TSSWCB, the Commission postponed consideration of the Gilleland Creek and Upper Oyster Creek bacteria TMDLs until August 8, 2007. However, the Commission adopted the Adams and Cow Bayous bacteria TMDLs. The Adams and Cow Bayous TMDLs must be approved by EPA before they are effective. An archived webcast of this meeting is available at http://www.texasadmin.com/cgi-bin/tnrcc.cgi.

At their June 27, 2007 regularly scheduled meeting, the TCEQ will consider the submission to EPA of the 2006 Texas Water Quality Assessment and List of Impaired Waters as required by the federal Clean Water Act §§305(b) and 303(d). This 303(d) List will add over 135 new bacteria impairments to the State's 2004 List of nearly 200 existing bacteria impairments.

TCEQ staff developed an Assessment of the Task Force Report. This May 29, 2007 document is attached. TCEQ staff stipulate that:

- the recommended three-tier approach may be difficult to achieve because of cost and budget cycle constraints
- the iterative tiered approach could affect their ability to project annual commitments and performance measures
- additional modeling and BST produce more assumptions and uncertainty not offset by the additional information produced

For these reasons, TCEQ staff recommend that the Report not be interpreted as a strict guidance document and that a review of water quality standards be included in the implementation of adopted bacteria TMDLs.

TCEQ staff interpret the Commission's establishment of the Task Force as related only to bacteria TMDLs in agriculture-dominated watersheds. TCEQ staff conclude that the Task Force recommendations are neither time-efficient nor cost-effective.

<u>TSSWCB Staff Comments on the Report</u>

TSSWCB staff generally agree with the Task Force recommendations in the Report. TSSWCB staff dissent with TCEQ staff and conclude that the tiered approach to TMDL development is time-efficient, cost-effective and scientifically credible.

Most of the technical and scientific concerns raised by stakeholders involved in the bacteria TMDL process across the state can be solved either by adherence to the recommended tiered approach or by utilizing the recommended modeling regime and BST methods, or are identified in the R&D section of the Report. However, it is only through the use of these recommendations <u>combined with</u> appropriate stakeholder collaboration and decision-making that reasonable and implement-able bacteria TMDLs will be developed.

TSSWCB staff dissent with TCEQ staff and conclude that the Task Force recommendations, and especially the tiered approach, have an inherent flexibility that is needed to deal with the diversity of each watershed and stakeholder group. Even rigorous adherence to this approach will not bind our ability develop TMDLs. Rather, in combination with the necessary stakeholder collaboration, the approach will make TMDL development "easier."

TSSWCB staff dissent with TCEQ staff and recommend the approval of the Recommended Approach for Bacteria TMDL and Implementation Plan Development as the Standard Operating Procedure for the Texas TMDL Program with a few minor changes regarding Use Attainability Analyses (UAAs) and "phased TMDLs."

The Task Force incorrectly applies the use of Use Attainability Analyses (UAAs). The goal of a UAA is to determine that the water quality standard protecting the current use (contact recreation) cannot be socially, economically, or realistically achieved or that the current use does not, in actually, exist. The UAA would then recommend a change in use (such as noncontact recreation) and a subsequent change in the water quality standard. A TMDL may or may not then be needed. A "provisional" TMDL should not be developed and adopted and then initiate the UAA process during implementation. TSSWCB staff dissent with TCEQ staff and recommend that if recreation standards are not appropriate for a waterbody, a TMDL should not be developed. Rather, a UAA should be developed.

The Task Force inappropriately applies EPA's guidance on "phased TMDLs." EPA limits the use of phased TMDLs to those established despite significant data uncertainty and where the loading capacity of the waterbody would be revised. This would likely not satisfy stakeholders in any current TMDL project. Additionally, EPA describes a phased TMDL being used when additional data or better analytical techniques would increase the accuracy of the TMDL. As discussed, the collection of additional data and better analytical techniques (Tier 2) will most always be needed. EPA describes the use of a phased TMDL in complex systems like a lake or estuary. While freshwater streams are by no means simple, they do not intrinsically have the complexity of a lake or estuary. EPA also cautions States to carefully consider the necessity of phased TMDLs, that is, to meet consent decree deadlines. Texas is not under a consent decree.

In order to accommodate the above discussion regarding UAAs and "phased TMDLs" into the three-tier approach, TSSWCB staff recommend the Board modify Figure 5 of the Report by:

- Striking *a draft TMDL that includes* from its three occurrences
- Striking *Initiate a "phased TMDL" and* from its single occurrence
- Striking *"phased TMDLs."* from its single occurrence and replacing with *TMDLs.*
- Striking *revise "phased TMDL"* from its single occurrence and replacing with *TMDL*.

While the Report provides a description of Load Duration Curves (LDCs), the Task Force does not make recommendations on the various details of LDC development. Many numerous and significant details associated with LDC development are not fleshed out due to the generalized scope of the Task Force. In order to develop an LDC, these issues must be resolved with appropriate stakeholder collaboration. Some of these intricacies are described in draft EPA guidance on developing LDCs. TSSWCB staff recommend the Board direct the development of a Texas Bacteria LDC guidance document, based on the draft EPA guidance, which details the minutiae of LDC development so that the State may have a fairly uniform LDC approach.

The Task Force notes that in nearly all cases, no single BST method should be solely relied upon. TSSWCB staff recommend the Board direct staff when utilizing library dependent BST, a composite of 2 different methods be used, selected from the three recommended combinations. Further, TSSWCB staff recommend the Board direct staff to continue to strengthen and expand the Texas BST Known Source Library. To accomplish this, TSSWCB staff recommend the Board direct the development of a Texas BST methodology guidance document that describes

appropriate quality assurance standards, quality control mechanisms and standard operating procedures for the four library dependent BST methods recommend for use by the Task Force.

The Report identifies four conditions under which Tier 3 might apply. It is important to note that these four conditions could easily apply: (1) most of the current draft bacteria TMDLs are calling for >75% reductions, (2) many of the freshwater stream bacteria impairments are on streams with no flow gages making uncertainty high and nearly 20% of impaired segments are for estuaries, tidal streams or lakes where an LDC is not appropriate, (3) calculating implementation costs is facilitated through the freedom sophisticated models bring in placing hypothetical BMPs to determine impact, and (4) the TMDLs (and WPPs) that have gained acceptance are those where stakeholders have been engaged in the decision making process for model assumptions rather than limiting their input to observing the assumptions made by staff and contractors.

In many situations, a waterbody has been listed as impaired based on the minimum data requirements – 10 samples over a five year period – or the waterbody may have a slightly better data record – 4 samples a year. This is perhaps the most frequent concern stakeholders have with the current draft TMDLs – insufficient data. Tier 1.4 states "LDC development at this point in the process will use exiting data." The State is generally limited by fiscal resources in carrying out a rigorous water quality monitoring regime that collects more than the minimum data needed to assess a waterbody's support of designated uses and water quality standards. This low volume of data is generally not sufficient to conduct either LDC analyses or sophisticated modeling. As such, most if not all bacteria TMDL projects should progress to Tier 2 to collect additional data. In fact, most of the bacteria impairments are currently categorized as 5c, that is, additional data will be collected before a TMDL is initiated.

Appendix 5 contains all comments received on the various drafts of the Report. Perhaps, the most noteworthy comments came from EPA. While their comments did not address the scope of the Task Force, they did address bacteria water quality standards. EPA's comments lay out several options Texas has to modify bacteria water quality standards. This implies EPA's willingness to approve these changes in standards. It would behoove the State to take note of these recommendations during the triennial standards review process now under way.

Attachments

1. *Memorandum of Agreement between the Texas Commission on Environmental Quality and the Texas State Soil and Water Conservation Board regarding Total Maximum Daily Loads, Implementation Plans, and Watershed Protection Plans* agreed to on September 27, 2006.
2. TCEQ memo regarding and summary of October 31, 2006 MOA Coordination meeting
3. TCEQ memo regarding and summary of March 29, 2007 MOA Coordination meeting
4. TSSWCB Priority List for TMDL Development and Implementation
5. List of active TSSWCB Clean Water Act §319(h) funded projects relating to the development or implementation of TMDLs
6. *TSSWCB Policy on TMDLs* approved May 24, 2007
7. List of Expert Advisors to the Task Force on Bacteria TMDLs
8. Excerpts from 4th draft (June 4, 2007) of the *Bacteria TMDL Task Force Report*, including the Executive Summary, Table 1, Table 2 and Figure 5
9. Summary of the May 16, 2007 meeting of TCEQ's Surface Water Quality Standards Advisory Workgroup
10. TCEQ staff Assessment of the Bacteria TMDL Task Force Report (May 29, 2007)

Attachment 1

*Memorandum of Agreement between the Texas Commission on Environmental Quality and the Texas State Soil and Water Conservation Board regarding Total Maximum Daily Loads, Implementation Plans, and Watershed Protection Plans* agreed to on September 27, 2006.

**Memorandum of Agreement**
**Between the**
**Texas Commission on Environmental Quality**
**and the**
**Texas State Soil and Water Conservation Board**
**Regarding**
**Total Maximum Daily Loads,**
**Implementation Plans, and**
**Watershed Protection Plans**

This Memorandum of Agreement (MOA) between the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) sets forth the coordination of program responsibilities relating to the development and implementation of Total Maximum Daily Loads (TMDLs), Implementation Plans (I-Plans), and Watershed Protection Plans (WPPs), by the two agencies. This MOA is intended to clarify and outline the coordination required for the agencies to effectively administer their duties, responsibilities, and functions as provided under Chapters 5 and 26 of the Texas Water Code and Chapter 201 of the Texas Agriculture Code.

The TCEQ has general jurisdiction and primary responsibility over Texas' water quality program including water quality management planning, the issuance of permits for point source discharges, abatement of nonpoint source pollution other than from agricultural and silvicultural sources, and enforcement of water quality rules, standards, orders, and permits. The TCEQ is responsible for establishing the level of quality to be maintained in, and controlling the quality of, water in the state (Texas Water Code §5.013 and §26.0136).

The TSSWCB is the lead agency in Texas for planning, implementing, and managing programs and practices for preventing and abating agricultural and silvicultural nonpoint source pollution (Texas Agriculture Code §201.026).

The federal Clean Water Act (CWA) requires Texas to identify water bodies failing to meet or not expected to meet water quality standards and not supporting their designated uses. This list of impaired water bodies (*Texas 303(d) List*) must be submitted to the U.S. Environmental Protection Agency (EPA) for review and approval every two years. The State must then establish a TMDL for water bodies identified on the *Texas 303(d) List* as prescribed by the CWA. The TCEQ has responsibility for establishing TMDLs for impaired water bodies in Texas. If the State fails to meet its obligations, the CWA requires EPA to establish TMDLs for the State.

A TMDL defines the amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL sets a pollution reduction goal for a parameter of concern necessary to restore attainment of the designated use of an impaired surface water body. For a watershed, a TMDL allocates pollutant loads between point sources (wasteload allocation or WLA) and nonpoint sources (load allocation or LA). It also takes into account a margin of safety (MOS), which reflects uncertainty and future growth. The effects of seasonal variation are also included. The development of a TMDL involves an extensive stakeholder process.

After the TMDL is approved, an I-Plan is developed to achieve the goals of the TMDL in the watershed. The I-Plan specifies limits for point source discharges and recommends best management practices for nonpoint sources. It also lays out a schedule for implementation. Commitment to the I-Plan by the citizens who live and work in the watershed is essential to success in reducing the pollutant loads and improving water quality. The I-Plan is also developed and implemented through a public stakeholder process. Together, the TMDL and the I-Plan serve as the mechanism to reduce the pollutant and restore attainment of the designated use of the water body.

A Watershed Protection Plan (WPP) is a coordinated framework for implementing prioritized and integrated water quality protection and restoration strategies driven by environmental objectives. The TCEQ and the TSSWCB provide technical and financial assistance to develop and implement WPPs that are consistent with the nine elements described by EPA as fundamental to achieve success. Through the WPP process, the State encourages stakeholders to holistically address all of the sources and causes of impairments and threats to both surface and ground water resources within the watershed. Developed and implemented through diverse, well integrated partnerships, a WPP assures the long-term health of the watershed with strategies for protecting unimpaired waters and/or restoring impaired waters.

The TCEQ and the TSSWCB both consider how any WPP effort should be coordinated with other efforts to assess water quality associated with an impairment, to avoid duplication with the development of a TMDL. All WPPs, whether developed before, after, or simultaneously with the development of a TMDL for one or more of the same waters, will be written or modified to be consistent with the load reductions described in the TMDL and the implementation strategies described in the I-Plan.

Development and implementation of TMDLs, I-Plans, and WPPs are time-consuming and resource-intensive processes. The TSSWCB and the TCEQ seek to reduce overall costs to the State of Texas, increase efficiency to the greatest extent possible, and prevent duplication of effort while developing effective TMDLs, I-Plans, and WPPs designed to attain and maintain water quality standards. Accordingly, the TCEQ and the TSSWCB intend to collaborate and cooperate so that resources can be devoted to TMDLs, I-Plans, and WPPs without waste or duplication.

The TCEQ and the TSSWCB are also parties to a Memorandum of Understanding (30 TAC §7.102) which coordinates jurisdictional authority, program responsibility, and procedural mechanisms for point and nonpoint source pollution control programs.

NOW THEREFORE, the TSSWCB and the TCEQ agree as follows:

a. The TCEQ agrees to:
   1. Accept water quality data provided by the TSSWCB and its contractors that was collected and analyzed under a Quality Assurance Project Plan authorized through the *TSSWCB Quality Management Plan* as approved by EPA and consistent with *EPA Requirements for Quality Assurance Project Plans (QA/R-5)* and that meets the data quality objectives of the applicable TCEQ water quality management program. TCEQ will consider these data during the development of the State's 303(d) list when the data quality objectives are consistent with the Quality Assurance Project Plan of the TCEQ Surface Water Quality Monitoring (SWQM) program.
   2. Consult the TSSWCB prior to assigning a category to a water body in the Texas Water Quality Inventory and listing or delisting a water body on the State's 303(d) list.
   3. Collaborate annually with the TSSWCB before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs.
   4. Inform the TSSWCB at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each project that the TSSWCB agrees are within its jurisdiction.
   5. Seek the TSSWCB's concurrence on TMDLs and obtain its approval on I-Plans, including those developed by third parties, which seek to attain or maintain water quality standards through load allocation of agricultural or silvicultural nonpoint source pollution or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution.

b. The TSSWCB agrees to:
   1. Coordinate with TCEQ to provide water quality data collected and analyzed under a Quality Assurance Project Plan authorized through the *TSSWCB Quality Management Plan* as approved by EPA and consistent with *EPA Requirement for Quality Assurance Project Plans (QA/R-5)* in a timely manner and in a format described in the TCEQ's most recent *SWQM Data Management Reference Guide*.
   2. Participate in the development of methodologies used to determine whether an impairment exists and to create the State's 303(d) list, and provide information on sources of pollutants related to agricultural and silvicultural practices.
   3. Assist TCEQ in the TMDL process in those waters where agricultural and/or silvicultural activities are believed to contribute to water quality impairments.
   4. Collaborate annually with the TCEQ before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs.
   5. Inform the TCEQ at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each TSSWCB project.
   6. Consider approval of TMDLs and I-Plans proposed by the TCEQ, including those developed by third parties, which seek to attain or maintain water quality standards through load allocation of agricultural or silvicultural nonpoint source pollution, or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution.
   7. Finance its participation in TMDLs, I-Plans, and WPPs with funds the TSSWCB deems appropriate for these programs, including but not limited to federal CWA §319(h) grant funds and state funds appropriated for this purpose. All expenditures on these programs will be consistent with the TSSWCB's statutory authority.

c. For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree:
    1. To collaborate in the solicitation and selection of interested parties who will participate in stakeholder groups.
    2. To work together, with stakeholders and other interested parties, to develop TMDLs, I-Plans, and WPPs designed to attain or maintain water quality standards.
    3. To jointly participate in providing information to stakeholder groups and other interested parties, so as to provide a unified message of a project under development, its potential impacts and conclusions from data analysis.
    4. That TSSWCB approval of TMDLs constitutes agreement on the WLA, LA, and MOS and concurrence with the LA of agricultural and silvicultural nonpoint sources; and, that TSSWCB approval of I-Plans constitutes consent that recommended management measures for control of agricultural and silvicultural nonpoint sources are consistent with the most recent *Texas Nonpoint Source Management Program*.
    5. To fulfill their obligations specified in I-Plans and WPPs through regulatory and non-regulatory programs within their respective jurisdictions.
    6. Neither agency will fund activities to develop a load allocation for a Category 5a impairment through a WPP.
    7. That priority consideration should be given for the development of WPPs in watersheds containing Category 5c impairments where a TMDL has not been initiated. In this way, progress towards achieving water quality standards is initiated even before a TMDL is established.
    8. That a WPP under development or implementation will not preclude the initiation, development, and establishment of a TMDL.
    9. That the TCEQ has a legal responsibility to establish TMDLs in impaired water bodies and to do so in a timely manner. WPPs to address impairments on the 2006 and future 303(d) lists should be developed within six years after the impairment is listed to allow for the development of a TMDL within the mandated timeframe, should one be necessary.

d. General Conditions:

1. Term of MOA. The term of this MOA shall be from the effective date until termination.
2. Effective Date. This MOA is effective upon execution by both parties. By signing this MOA, the signatories acknowledge that they are acting under proper authority from their governing bodies.
3. Modification. Only by mutual agreement and upon written concurrence of both parties can this MOA be modified.
4. Notice of Termination. Either party may terminate this MOA upon thirty (30) days written notice to the other party.
5. Cooperation of Parties. It is the intention of the TSSWCB and the TCEQ that the details of providing the services in support of this MOA shall be resolved, in good faith, by both agencies.
6. Notices. Any written notices required by this MOA shall be addressed to the respective party as follows:

   Texas Commission on Environmental Quality
   Attn: _____
   PO Box 13087
   Austin, TX 78711-3087

   Texas State Soil and Water Conservation Board
   Attn: _____
   PO Box 658
   Temple, TX 76503-0658

7. Termination of Existing MOA. Upon execution of this MOA by both parties, the *Memorandum of Agreement between the Texas Natural Resource Conservation Commission and the Texas State Soil and Water Conservation Board Regarding Total Maximum Daily Loads*, executed on February 12, 1999 by the TNRCC and on March 5, 1999 by the TSSWCB, is terminated.

Agreed to, on behalf of the TCEQ and the TSSWCB, on September 27, 2006, by

| | |
|---|---|
| Glenn Shankle<br>Executive Director<br>Texas Commission on Environmental Quality | Rex Isom<br>Executive Director<br>Texas State Soil and Water Conservation Board |

Attachment 2

TCEQ memo regarding and summary of October 31, 2006 MOA Coordination meeting

# Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

**To:** Chairman Kathleen Hartnett White
Commissioner Larry R. Soward
Commissioner Martin A. Hubert
Glenn Shankle, Executive Director
Mark Vickery, Deputy Executive Director

**Date:** 6 December 2006

**Thru:** David C. Schanbacher, P.E., Chief Engineer

**From:** Thomas Weber, Manager, Water Programs Division, Chief Engineer's Office

**Subject:** Implementation of the Memorandum of Agreement between the Texas Commission on Environmental Quality and the Texas State Soil and Water Conservation Board

The reauthorized Memorandum of Agreement (MOA) between the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) was signed and approved on September 27, 2006. When it was considered for approval, the Commissioners and TSSWCB Board Members requested a quarterly report on efforts by the agencies to implement the MOA. The first quarter of FY 2007 has just concluded and this is the first such update.

Staff of the two agencies met on October 31st to collaborate on planned and future efforts relating to Total Maximum Daily Loads (TMDLs), TMDL Implementation Plans (I-Plans), and Watershed Protection Plans (WPPs). Additionally, discussions focused on several other topics as outlined in the meeting agenda (Attachment 1). TCEQ staff represented the following agency water quality programs: TMDL, standards, monitoring, data management, 303(d)/305(b) assessment, Clean Rivers Program, and nonpoint source (NPS) pollution management. The TSSWCB staff represented their NPS Team (whose program responsibilities include 319, NPS, TMDL, WPP, SWQM, data management, and QA/QC).

Attachment 2 identifies the lists of projects discussed at the meeting, inclusive of TMDLs projected for Fiscal Year (FY) 2007 Commission adoption, completed TMDLs, TMDLs scheduled for future adoption, active TCEQ and TSSWCB NPS grant projects, and TSSWCB priority watersheds (impairments and known agricultural/silvicultural activities). Finally, Attachment 3 is a table describing all activities of the agencies sorted by provision of the MOA.

This memo and associated attachments were prepared in collaboration with TSSWCB staff and will be shared with TSSWCB Board Members. This is the first report and the programs aim to meet your expectations. Please provide any feedback you have on the format of the reporting. As

well, please contact Thomas Weber if you have any questions relating to this material or if you wish to be briefed.

cc: John Foster, TSSWCB
Commission Executive Assistants
John Steib, Deputy Director, OCE
Dan Eden, Deputy Director, OPRR:
Linda Brookins, Special Assistant, OCE
Patrick Roques, Monitoring Operations Division
Mark Fisher, Water Quality Division
Faith Hambleton, Water Programs Division

# Attachment 3 – Implementation of the Memorandum of Agreement between the Texas Commission on Environmental Quality and the Texas State Soil and Water Conservation Board

**Provision a.1.** The TCEQ agrees to accept water quality data provided by the TSSWCB and its contractors that was collected and analyzed under a Quality Assurance Project Plan authorized through the *TSSWCB Quality Management Plan* as approved by EPA and consistent with *EPA Requirements for Quality Assurance Project Plans (QA/R-5)* and that meets the data quality objectives of the applicable TCEQ water quality management program. TCEQ will consider these data during the development of the State's 303(d) list when the data quality objectives are consistent with the Quality Assurance Project Plan of the TCEQ Surface Water Quality Monitoring (SWQM) program. **Provision b.1.** The TSSWCB agrees to coordinate with TCEQ to provide water quality data collected and analyzed under a Quality Assurance Project Plan authorized through the *TSSWCB Quality Management Plan* as approved by EPA and consistent with *EPA Requirement for Quality Assurance Project Plans (QA/R-5)* in a timely manner and in a format described in the TCEQ's most recent *SWQM Data Management Reference Guide*.

**Activities:** TCEQ formed an internal workgroup that is reviewing the new SWQM-IS database system to develop coding methods for handling TSSWCB data. TSSWCB identified the types of data that may be appropriate to provide to TCEQ's system as: sediment, water, and soil analyses. TCEQ may be receiving some TSSWCB data that was collected by USGS or CRP Partners. TSSWCB points of contact are Donna Long and Aaron Wendt. TCEQ point of contact is Patrick Roques.

**Action Items:**

- The TCEQ will determine what USGS data originated from TSSWCB funded efforts
- TCEQ will identify coding and data formatting requirements after it reviews the SWQM-IS capabilities and will communicate its proposal to TSSWCB, approximately by the end of November.
- MonOps/SWQM will convene a meeting with TSSWCB to specifically discuss datasets, coding, and data exchange.
- TSSWCB will provide QAPPs from current projects to serve as "pilots" for data transfer.

**Provision a.2.** The TCEQ agrees to consult with the TSSWCB prior to assigning a category to a water body in the Texas Water Quality Inventory and listing or delisting a water body on the State's 303(d) list. **Provision b.2.** The TSSWCB agrees to participate in the development of methodologies used to determine whether an impairment exists and to create the State's 303(d) list, and provide information on sources of pollutants related to agricultural and silvicultural practices.

**Activities:** TCEQ is preparing the 2006 Water Quality Assessment and 303(d) List. TCEQ will convene a meeting of data providers and state agencies on January 11 and 12 to review the use of new data contributed for the 2006 assessment. Although the meeting will be open to all stakeholders, input will come primarily from monitoring staff at river authorities, who contribute about 60% of the data, and TCEQ regional monitoring staff. TSSWCB participation will contribute to information on pollution sources, category assignment for management action such as additional monitoring and standards review, and ranking for TMDL initiation.

**Action Items:**

- MonOps/SWQM will send out meeting announcement in early December and will also follow up by sending out a draft list of impairments and categories approximately two weeks prior to the stakeholder meeting.

**Provision a.3.** The TCEQ agrees to collaborate annually with the TSSWCB before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs. **Provision b.4.** The TSSWCB agrees to collaborate annually with the TCEQ before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs

**Activities:** Agencies met October 31st, 2006. Current and future project lists (TMDLs, WPPs, 319 grant projects, I-Plans) were handed-out and discussed.

TMDLs being proposed for TCEQ adoption in FY 2007 The TSSWCB indicated the following will not need further collaboration: Nueces Bay zinc in oysters, Petronila Creek TDS/Cl/SO4, Colorado River below Spence Res. TDS/Cl, Upper San Antonio River bacteria, and Mid-Cibolo Creek DO. For five other TMDL projects scheduled for 2007 adoption, the TSSWCB will consider whether to take the projects to their board for formal concurrence. These include bacteria TMDLs for Gilleland Creek, Guadalupe River above Canyon Res., Orange Co., Upper Oyster Creek, and Oso Creek/Bay. The level of interest by TSSWCB will consider factors like future agricultural implementation activities, stakeholder interest, and the significance of impacts on producers. TSSWCB concurrence would typically occur between the dates of TCEQ proposal (but after close of public comment) and adoption.

TSSWCB 319 Projects TSSWCB provided a list and discussed its ongoing 319 projects as well as future projects it is beginning under 319. A new project, "Lone Star Healthy Streams," involves BMP effectiveness testing and education relating to cattle grazing techniques. It will focus on bacteria-impaired watersheds possibly including Plum Creek, Lower San Antonio River, Copano Bay, and Leon River. Another new project, "Technical Assistance Supporting Cooperative Conservation in South Central Texas," involves providing technical assistance to livestock producers to aid in the utilization of cost-share funds from the NRCS EQIP South Central Texas Water Quality State Resource Concern which is targeted to livestock producers in the Elm and Sandies Creeks, Atascosa River, Lower San Antonio River and Peach Creek watersheds.

TMDL I-Plans to be prepared for FY 2007 The TCEQ has not formalized its plans but is considering adopting I-Plans for Nueces Bay, Petronila Creek, Colorado River below Spence Res., and Lake O' Pines. Of these, the TSSWCB is significantly involved in Lake O' Pines and will provide information for Colorado River below Spence Res.

TCEQ 319 Projects TCEQ presented a list and discussion of 319 projects underway. Currrently, the program is developing project plans for FY07 funding. One project in particular, a watershed plan for Cypress Creek (Segment 1815), will be discussed with the TSSWCB staff when more details are available.

**Action Items:**

- TCEQ will provide Aaron Wendt at TSSWCB the draft TMDL reports once at the peer review stage, for the 5 projects under consideration. TSSWCB will respond with any comments within 2 weeks of receipt. TSSWCB will notify TCEQ of the ones that will need their Board's formal concurrence.

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| • TSSWCB will update their list of priority watersheds by adding two columns to the table. They will add pollutant source information that they may have and also identify the impairment/project as either high or low priority. High will mean that collaboration on the project will be needed. Low will mean lesser involvement such as monitoring stakeholder meetings.<br>• The updated list will be prepared by December 31st, 2006.<br>• TCEQ/TMDL will provide mail labels and stakeholder lists to TSSWCB to assist in starting the "Technical Assistance Supporting Cooperative Conservation in South Central Texas" project. (**Update:** The stakeholder lists cannot be shared due to prohibitions in state law (Tex. Gov. Code, Section 552.137).<br>• Collaboration between project managers in both agencies on the Lake O' Pines I-Plan is ongoing. TCEQ is working with point source dischargers and TSSWCB is working with agricultural producers in the watershed. A draft I-Plan will be prepared for distribution in early January and discussed at work group meetings on January 16, 2007. |
| .**Provision b.3.** The TSSWCB agrees to assist TCEQ in the TMDL process in those waters where agricultural and/or silvicultural activities are believed to contribute to water quality impairments |
| **Activities:** Assistance and collaboration is ongoing for several projects addressing impaired waters (monitoring in Aransas/Mission River watersheds, preparation of Arroyo Colorado and Plum Creek WPP, monitoring and WPP prep for Buck Creek). Future involvement in TMDLs will be denoted as a "high" priority on the updated list, to be prepared by TSSWCB. |
| **Action Items:** The updated list will be prepared by December 31st, 2006. |
| **Provision a. 4.**. The TCEQ agrees to inform the TSSWCB at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each project that the TSSWCB agrees are within its jurisdiction. **Provision b.5.** The TSSWCB agrees to inform the TCEQ at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each TSSWCB project. |
| **Activities:** The annual meeting on Oct. 31, 2006, constituted the 1st quarter information exchange. |
| **Action Items:**<br>• A coordination meeting will be convened between the agencies in February, 2007. |
| **Provision a.5.** The TCEQ agrees to seek the TSSWCB's concurrence on TMDLs and obtain its approval on I-Plans, including those developed by third parties, which seek to attain or maintain water quality standards through load allocation of agricultural or silvicultural nonpoint source pollution or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution. **Provision b.6.** The TSSWCB agrees to consider approval of TMDLs and I-Plans proposed by the TCEQ, including those developed by third parties, which seek to attain or maintain water quality standards through load allocation of agricultural or silvicultural nonpoint source pollution, or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution. |
| **Activities:** From the list of TMDLs that TCEQ plans to adopt in 2007, the TSSWCB will identify which ones will go to formal concurrence through their Board and may include Gilleland Creek, Guadalupe River above Canyon Lake, Orange County, Upper Oyster |

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| Cree and Oso Creek/Bay. TCEQ identified the I-Plans to be developed in FY 2007, including: Lake O' Pines DO. The TSSWCB will be an integral part of this I-Plan development, to address poultry production operations in the watershed. |
| **Action Items:**<br>• From the TCEQ list of adoptions, TSSWCB will notify TCEQ of the TMDL projects on which it will seek Board concurrence.<br>• The TSSWCB will be assisting TCEQ in preparing the Lake O' Pines I-Plan and it will go for Board approval. |
| **Provision b.7.** The TSSWCB agrees to finance its participation in TMDLs, I-Plans, and WPPs with funds the TSSWCB deems appropriate for these programs, including but not limited to federal CWA §319(h) grant funds and state funds appropriated for this purpose. All expenditures on these programs will be consistent with the TSSWCB's statutory authority |
| **Activities:** See discussion under Provision a.3/b.4. |
| **Action Items:** |
| **Provision c.1.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to collaborate in the solicitation and selection of interested parties who will participate in stakeholder groups |
| **Activities:** Strategies will be specific to each project. Collaboration on additional projects will be planned after the "high" priorities of the TSSWCB are determined. |
| **Action Items:** TSSWCB will provide lists of agricultural and silvicultural stakeholders to include in future TCEQ project communications |
| **Provision c.2.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to work together, with stakeholders and other interested parties, to develop TMDLs, I-Plans, and WPPs designed to attain or maintain water quality standards |
| **Activities:** Strategies will be specific to each project. Collaboration on additional projects will be planned after the "high" priorities of the TSSWCB are determined. |
| **Action Items:** Copano Bay coordination activities, Lake O' Pines TMDL I-Plan coordination activities |
| **Provision c.3.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to jointly participate in providing information to stakeholder groups and other interested parties, so as to provide a unified message of a project under development, its potential impacts and conclusions from data analysis. |
| **Activities:** Strategies will be specific to each project. Collaboration on additional projects will be planned after the "high" priorities of the TSSWCB are determined. |
| **Action Items:** |
| **Provision c.4.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that TSSWCB approval of TMDLs constitutes agreement on the WLA, LA, and MOS and concurrence with the LA of agricultural and silvicultural nonpoint sources; and, that TSSWCB approval of I-Plans constitutes consent that recommended management measures for control of agricultural and silvicultural nonpoint sources are consistent with the most recent *Texas Nonpoint Source Management Program*. |

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| **Activities:** No issues or action items have been identified. |
| **Action Items:** TCEQ has provided TSSWCB with peer review versions of the several TMDLs including Orange County, Upper Oyster Creek and Gilleland Creek |
| **Provision c.5.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to fulfill their obligations specified in I-Plans and WPPs through regulatory and non-regulatory programs within their respective jurisdictions. |
| **Activities:** No issues or action items have been identified. |
| **Action Items:** |
| **Provision c.6.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree neither agency will fund activities to develop a load allocation for a Category 5(a) impairment through a WPP. |
| **Activities:** TSSWCB is funding a WPP in the Leon River watershed. This decision was made prior to reauthorization of the MOA and is not inconsistent with the reinvigorated coordination intended with the MOA. TCEQ experience when WPP and TMDL development activities are both ongoing in the same watershed is that there needs to be close coordination in order to avoid duplication and to ensure that the two initiatives work together in a complementary manner. TCEQ is working with stakeholders in a some 5(a) water bodies (Arroyo Colorado, Upper San Antonio River, Dickinson Bayou, Caddo Lake) to streamline and simplify the process. |
| **Action Items:** TSSWCB will coordinate the WPP in the Leon River watershed with the TCEQ. Initially, TSSWCB will provide the TCEQ with a copy of the project work plan. TCEQ will provide TSSWCB with information related to "adaptive implementation" projects. |
| **Provision c.7.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that priority consideration should be given for the development of WPPs in watersheds containing Category 5(c) impairments where a TMDL has not been initiated. In this way, progress towards achieving water quality standards is initiated even before a TMDL is established. |
| **Activities:** The TSSWCB agrees to participate in the development of methodologies used to determine whether an impairment exists and to create the State's 303(d) list, and provide information on sources of pollutants related to agricultural and silvicultural practices. |
| **Action Items:**<br>• TSSWCB participation in the meeting.<br>• Identification of possible agricultural pollutant sources.<br>• Determining which agency should work on specific 5-c water bodies.<br>• TSSWCB will prioritize 5c waterbodies for WPP development in their FY07 CWA 319 RFP |
| **Provision c.8.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that a WPP under development or implementation will not preclude the initiation, development, and establishment of a TMDL. |
| **Activities:** No issues or action items have been identified. |
| **Action Items:** Discussion of WPP results at next quarterly meeting. |

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| **Provision c.9.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that the TCEQ has a legal responsibility to establish TMDLs in impaired water bodies and to do so in a timely manner. WPPs to address impairments on the 2006 and future 303(d) lists should be developed within six years after the impairment is listed to allow for the development of a TMDL within the mandated timeframe, should one be necessary. |
| **Activities:** At the Oct. 31st meeting, EPA performance activity measures (PAMs) were discussed. TMDL output is tracked by EPA under WQ 13 and EPA is requiring TCEQ commitment of 32 TMDLs in FY07. The agencies also discussed WQ 27 and concluded that various parties could interpret "substantially implemented" in various ways. Stakeholders engaged in watershed planning projects should generate definition of "substantially implemented" as appropriate for their watershed. TCEQ described its management's directive to provide quarterly reports on the status of water quality impairments in Categories 5(a), (b), and (c). The reporting is a new mechanism to better track how impairments are being addressed with available resources in a timely manner. The first such quarterly report was provided to the TSSWCB. TCEQ indicated its interest in working to include the projects the Board manages which address impairments. |
| **Action Items:**<br>• The two agencies will work with stakeholders in the various watersheds to ensure a definition of "substantially implemented" is included in WPPs, with the goal of providing EPA a consistent measurement of progress.<br>• The TCEQ will continue to provide the quarterly reports to TSSWCB. The next quarter's report will be finalized in December, 2006. |

Attachment 3

TCEQ memo regarding and summary of March 29, 2007 MOA Coordination meeting

# Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

**To:** Chairman Kathleen Hartnett White
Commissioner Larry R. Soward
Commissioner H. S. Buddy Garcia
Glenn Shankle, Executive Director
Mark Vickery, Deputy Executive Director

**Date:** 23 May 2007

**Thru:** David C. Schanbacher, P.E., Chief Engineer

**From:** Thomas Weber, Manager, Water Programs Division, Chief Engineer's Office

**Subject:** Second Quarterly Update on Implementation of the Memorandum of Agreement between the TCEQ and the Texas State Soil and Water Conservation Board: January – March 2007

The reauthorized Memorandum of Agreement (MOA) between the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) was signed and approved on September 27, 2006. When it was considered for approval, the Commissioners and TSSWCB Board Members requested a quarterly report on efforts by the agencies to implement the MOA. This is the second quarterly update for January through March 2007.

Staff of the two agencies met on March 29th to collaborate on planned and future efforts relating to Total Maximum Daily Loads (TMDLs), TMDL Implementation Plans (I-Plans), and Watershed Protection Plans (WPPs). Additionally, discussions focused on several other topics as outlined in the meeting agenda (Attachment 1) and summarized in the updated table (Attachment 2) describing all activities of the agencies sorted by provision of the MOA.

TCEQ staff represented the following agency water quality programs: TMDL, standards, monitoring, data management, 303(d)/305(b) assessment, Clean Rivers Program, and nonpoint source (NPS) pollution management. The TSSWCB staff represented their NPS Team (whose program responsibilities include NPS, TMDL, WPP, SWQM, data management, and QA/QC). Staff from EPA Region 6 attended who provide state agency oversight of the federal NPS (CWA Sec. 319) grant.

The attachments were prepared in collaboration with TSSWCB staff and will be shared with TSSWCB Board Members. Please contact Thomas Weber if you have any questions relating to this material or if you wish to be briefed.

cc: John Foster, TSSWCB

# Memorandum of Agreement
# Texas Commission on Environmental Quality and the Texas State Soil and Water Conservation Board
# Implementation Progress Report
# 2nd Quarter FY 2007

**Provision a.1.** The TCEQ agrees to accept water quality data provided by the TSSWCB and its contractors that was collected and analyzed under a Quality Assurance Project Plan authorized through the TSSWCB Quality Management Plan as approved by EPA and consistent with EPA Requirements for Quality Assurance Project Plans (QA/R-5) and that meets the data quality objectives of the applicable TCEQ water quality management program. TCEQ will consider these data during the development of the State's 303(d) list when the data quality objectives are consistent with the Quality Assurance Project Plan of the TCEQ Surface Water Quality Monitoring (SWQM) program. **Provision b.1.** The TSSWCB agrees to coordinate with TCEQ to provide water quality data collected and analyzed under a Quality Assurance Project Plan authorized through the TSSWCB Quality Management Plan as approved by EPA and consistent with EPA Requirement for Quality Assurance Project Plans (QA/R-5) in a timely manner and in a format described in the TCEQ's most recent SWQM Data Management Reference Guide.

**Activities:**

- During this past quarter, the TCEQ sent the TSSWCB information on coding data sets to facilitate the transfer of the TSSWCB's water quality data to the TCEQ. TCEQ may already be receiving some TSSWCB data that was collected by USGS or CRP Partners.
- Coordinated monitoring meeting information was provided to the TSSWCB during the March 29th meeting. The TSSWCB has been participating in this process.

**Action Items:**

- The TCEQ -SWQM will review any new data submitted by the TSSWCB to determine if it has already been acquired from the USGS or CRP Partners. MonOps/SWQM will convene a meeting or conference call with the TSSWCB to specifically discuss datasets, coding, and data exchange.
- TSSWCB will provide the Copano Bay QAPP to the TCEQ-SWQM to use as a "pilot" to develop coding and data exchange processes.
- The TCEQ-CRP will notify the Clean Rivers Program partners to be sure the TSSWCB is on the list of invitees for coordinated monitoring meetings.
- TSSWCB and/or its contractors will continue to participate in coordinated monitoring meetings for those basins in which

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| TSSWCB is funding or anticipating funding SWQM activities. |
| **Provision a.2.** The TCEQ agrees to consult with the TSSWCB prior to assigning a category to a water body in the Texas Water Quality Inventory and listing or delisting a water body on the State's 303(d) list. **Provision b.2.** The TSSWCB agrees to participate in the development of methodologies used to determine whether an impairment exists and to create the State's 303(d) list, and provide information on sources of pollutants related to agricultural and silvicultural practices. |
| **Activities:**<br>• TCEQ-SWQM posted the 2006 Water Quality Assessment and 303(d) List for a 30 day public comment period beginning March 19, 2007. Information regarding this was sent to the TSSWCB via e-mail.<br>• EPA continues to develop draft guidance to use WPPs to move category 5 waterbodies to category 4b. Both agencies await this guidance. |
| **Action Items:**<br>• The TSSWCB will send the 2006 Water Quality Assessment and 303(d) List to their Field Representatives and Regional Offices to get information on sources and category rankings. This information will be provided to TCEQ-SWQM.<br>• The TSSWCB will send TCEQ-SWQM information on impairments that are candidates for WPPs, if there are any. These will stay in Category 5c for a few years after listing to give time for those leading the watershed protection plan to develop restoration strategies for the impairment. |
| **Provision a.3.** The TCEQ agrees to collaborate annually with the TSSWCB before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs. **Provision b.4.** The TSSWCB agrees to collaborate annually with the TCEQ before considering future watersheds in which to focus agency resources on TMDLs, I-Plans, or WPPs |
| **Activities**:<br>• Agencies met March 29, 2007. Current and future project lists (TMDLs, WPPs, 319 grant projects, I-Plans) were handed-out and discussed. A timeline for TMDL projects was handed-out and discussed.<br>• <u>TMDL Development Projects</u> – TCEQ and TSSWCB updated the TMDL Project List and identified the projects as either high or low priority. A "High" priority denotes projects in which TSSWCB will have substantial input and which will go before the State Board for formal concurrence. A "Low" priority designation identifies projects in which the TSSWCB will participate and follow, but which will not go before the State Board for formal concurrence (based on current understanding of agricultural and silvicultural NPS loadings). Additional TMDL projects which do not involve agricultural and/or silvicultural activities were eliminated from the TMDL Project List. TSSWCB had no comments and will not seek formal action from their board on the Gilleland Creek and Upper Oyster Creek TMDLs. TSSWCB has provided comments and will seek formal action from their board on the Orange County TMDL. The comment process for the Guadalupe River above Canyon Reservoir |

TMDL is ongoing. The comment process for the Oso Bay TMDL has not yet begun. Several bacteria TMDL projects involving livestock sources are either on hold (Peach Creek, Leon River, Lower San Antonio River) or public meetings are being suspended (Copano Bay, Elm Creek, Sandies Creek, and Atascosa River). The TCEQ expects Commission action on the task force report before formal stakeholder activities resume in these project areas. The TSSWCB suggested TCEQ should communicate the status of these projects to stakeholders.

- TMDL I-Plan Projects - The development of the I-Plan for the Lake O' the Pines TMDL is ongoing with participation of the TCEQ and TSSWCB.
- Non-TMDL Projects – TCEQ has projects which do not result in a TMDL, but which support the program objectives. The Bosque II project is nearing completion and a decision to revise the existing TMDL is due in August 2007. TCEQ-WQS will provide a summary of the HGAC project looking into the feasibility of conducting an epidemiology study of bacteria in the Houston area. The Tidal Waters UAA project will probably not influence revisions to WQS's during this cycle. BMP efficiency study in the Houston area may have implications to other TMDL project areas. TCEQ will seek funding for study of bacteria re-growth issues and will send TSSWCB a copy of the proposal once the contracting is completed.
- TSSWCB 319 Projects - TSSWCB provided a list and discussed its ongoing 319 projects as well as future projects it is beginning under 319. A new project, "Lone Star Healthy Streams," involves BMP effectiveness testing and education relating to cattle grazing techniques. It will focus on bacteria-impaired watersheds possibly including Plum Creek, Lower San Antonio River, Copano Bay, and Leon River. Two new projects are focused on the Copano Bay watershed including SWQM with Nueces River Authority and an education campaign with Texas Cooperative Extension. Another new project, "Technical Assistance Supporting Cooperative Conservation in South Central Texas," involves providing technical assistance to livestock producers to aid in the utilization of cost-share funds from the NRCS EQIP State Resource Concern for Water Quality in South Central Texas which is targeted to livestock producers in the Elm and Sandies Creeks, Atascosa River, Lower San Antonio River and Peach Creek watersheds. TSSWCB sought and received TCEQ comments on proposals received through the TSSWCB FY2007 319 RFP, specifically for Lower San Antonio River WPP development and Lampasas River WPP development. The Arroyo Colorado Ag NPS Assessment project is in sync with the TMDL development and WPP Implementation. Funding has been fully utilized for DMES and payments to haulers have concluded.
- TCEQ 319 Projects - TCEQ provided an updated list of projects to be funded with Section 319 funds. The list included draft FY 07 projects currently under review at EPA. TSSWCB collaboration will be significant for 15th National NPS Monitoring Conference and WPP Shortcourse Development. BST will be performed by TAES-El Paso for the Lake Granbury WPP.

**Action Items:**

- TCEQ-WQS will send summary of HGAC project to TSSWCB

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| • TCEQ-TMDL will send copy of proposal for bacteria re-growth study to TSSWCB once the contracting is completed.<br>• The agencies will develop and implement a communication plan for the "on hold" bacteria TMDL projects.<br>• The TCEQ-319 will send the FY 07 Texas Watch grant work plan to the TSSWCB for their review.<br>• The TSSWCB will send the project proposals on the Lower San Antonio WPP and the Lampasas River WPP to TCEQ-TMDL/319 if they decide to request funding for these projects under the 319 grant.<br>• TCEQ and TSSWCB need to schedule joint work session for formal action on the Bacteria TMDL Task Force Report so that progress may resume on numerous bacteria TMDL projects. |
| **Provision b.3.** The TSSWCB agrees to assist TCEQ in the TMDL process in those waters where agricultural and/or silvicultural activities are believed to contribute to water quality impairments |
| **Activities:**<br>• Assistance and collaboration is ongoing for several projects addressing impaired waters (monitoring in Aransas/Mission River watersheds, preparation of Arroyo Colorado and Plum Creek WPP, monitoring and WPP prep for Buck Creek).<br>• TSSWCB involvement in TMDL projects is summarized in the List of TMDL Projects. |
| **Action Items:**<br>• Ongoing project coordination |
| **Provision a. 4.** The TCEQ agrees to inform the TSSWCB at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each project that the TSSWCB agrees are within its jurisdiction. **Provision b.5.** The TSSWCB agrees to inform the TCEQ at least quarterly concerning future and ongoing TMDL, I-Plan, and WPP activities for each TSSWCB project. |
| **Activities:**<br>• The meeting for the 3rd quarter of FY 2007 was held on March 29, 2007 at the State Board offices in Temple. Representatives of the USEPA Region 6 were also in attendance. |
| **Action Items:**<br>• The meeting for the 4th quarter of FY 2007 will be scheduled in approximately 3 months. |
| **Provision a.5.** The TCEQ agrees to seek the TSSWCB's concurrence on TMDLs and obtain its approval on I-Plans, including those developed by third parties, which seek to attain or maintain water quality standards through load allocation of agricultural or silvicultural nonpoint source pollution or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution. **Provision b.6.** The TSSWCB agrees to consider approval of TMDLs and I-Plans proposed by the TCEQ, including those developed by third parties, which seek to attain or maintain water quality standards |

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| through load allocation of agricultural or silvicultural nonpoint source pollution, or through implementation of regulatory and non-regulatory strategies for control of agricultural or silvicultural nonpoint source pollution. |
| **Activities:**<br>• From the attached TMDL Project List, TMDL and I-Plan projects scheduled for adoption or approval in FY 2007 and needing formal concurrence from the State Board are: the Orange County and Oso Bay TMDL projects and the Lake O' the Pines I-Plan project. A decision on the Guadalupe River above Canyon Reservoir TMDL project is still pending consideration by TSSWCB staff. |
| **Action Items:**<br>• Coordinate adoptions and approvals of the Orange County and Oso Bay TMDL projects and the Lake O' the Pines I-Plan project during FY 2007.<br>• TSSWCB will clarify high/low priority status of Guadalupe River above Canyon Reservoir TMDL. |
| **Provision b.7.** The TSSWCB agrees to finance its participation in TMDLs, I-Plans, and WPPs with funds the TSSWCB deems appropriate for these programs, including but not limited to federal CWA §319(h) grant funds and state funds appropriated for this purpose. All expenditures on these programs will be consistent with the TSSWCB's statutory authority |
| **Activities:** TSSWCB and TCEQ discussed with EPA how NOAA conditional approval of the Coastal NPS Management Plan will impact 319 funding for both agencies. If conditions not met, Texas 319 allocation could face a 30% cut. |
| **Action Items:** Both agencies need to engage GLO and bring into the discussion to address NOAA's remaining conditions. |
| **Provision c.1.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to collaborate in the solicitation and selection of interested parties who will participate in stakeholder groups |
| **Activities:**<br>• Strategies will be specific to each project.<br>• TCEQ specifically requested assistance from the TSSWCB in identifying interested parties for the Dickinson Bayou Watershed and Northwest Houston Bacteria projects. |
| **Action Items:**<br>• TSSWCB will provide lists of agricultural and silvicultural stakeholders to support TMDL projects identified in the attached TMDL project List including the Dickinson Bayou Watershed and Northwest Houston Bacteria TMDL projects. |
| **Provision c.2.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to work together, with stakeholders and other interested parties, to develop TMDLs, I-Plans, and WPPs designed to attain or maintain water quality standards |
| **Activities:** |

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| • Strategies will be specific to each project. The level of collaboration will reflect the TSSWCB priorities indicated on the attached TMDL Project List. |
| **Action Items:**<br>• Coordination on individual projects is ongoing. |
| **Provision c.3.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to jointly participate in providing information to stakeholder groups and other interested parties, so as to provide a unified message of a project under development, its potential impacts and conclusions from data analysis. |
| **Activities:**<br>• Strategies will be specific to each project. The level of collaboration will reflect the TSSWCB priorities indicated on the attached TMDL Project List. |
| **Action Items:**<br>• Coordination on individual projects is ongoing. |
| **Provision c.4.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that TSSWCB approval of TMDLs constitutes agreement on the WLA, LA, and MOS and concurrence with the LA of agricultural and silvicultural nonpoint sources; and, that TSSWCB approval of I-Plans constitutes consent that recommended management measures for control of agricultural and silvicultural nonpoint sources are consistent with the most recent *Texas Nonpoint Source Management Program*. |
| **Activities:**<br>• TMDL projects scheduled for adoption in FY 2007 and needing formal concurrence from the State Board are: the Orange County and Oso Bay TMDL projects and the Lake O' the Pines I-Plan project. |
| **Action Items:**<br>• Coordinate adoptions and approvals of the Orange County and Oso Bay TMDL projects and the Lake O' the Pines I-Plan project during FY 2007. |
| **Provision c.5.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree to fulfill their obligations specified in I-Plans and WPPs through regulatory and non-regulatory programs within their respective jurisdictions. |
| **Activities:**<br>• From the attached TMDL Project List, three projects which are a high priority for TSSWCB are in the implementation phase: E.V. Spence-TDS, N. Bosque River-Phosphorus, and Aquilla-Atrazine. Implementation activities for these projects are ongoing.<br>• TCEQ-TMDL prepares a report every other year on the status of implementation activities and water quality conditions in TMDL project areas. |

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| **Action Items:**<br>• Continue implementation activities for TMDL projects in implementation phase.<br>• Continue reporting status of implementation activities and water quality conditions for preparation of annual report. |
| **Provision c.6.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree neither agency will fund activities to develop a load allocation for a Category 5(a) impairment through a WPP. |
| **Activities:**<br>• TSSWCB is funding a WPP in the Leon River watershed. This decision was made prior to reauthorization of the MOA but it is not inconsistent with the reinvigorated coordination intended with the MOA. TCEQ experience when WPP and TMDL development activities are both ongoing in the same watershed is that there needs to be close coordination in order to avoid duplication and to ensure that the two initiatives work together in a complementary manner. TCEQ expressed some confusion about the plan to coordinate the WPP in the Leon River watershed with the TMDL development project and requested clarification.<br>• TSSWCB indicated they received a proposal to develop a WPP for the Lower San Antonio River in response to their solicitation for 2007 319 grant projects. It was discussed that the Lower San Antonio River is a category 5(a) listing and TMDL development activities have been initiated.<br>• TCEQ described how the agency is working with stakeholders in some 5(a) water bodies (Upper San Antonio River) to coordinate TMDL activities with WPP and WPP-related activities. |
| **Action Items:**<br>• TSSWCB will provide clarification as to its plan to coordinate the development of a WPP in the Leon River watershed with the TMDL development project. As the EPA-approved workplan with BRA is non-descript, details will be highly dependent on BRA-selected contractor. TSSWCB will provide clarification on coordination once BRA has selected contractor for WPP development activities.<br>• TSSWCB will review the proposal for the Lower San Antonio River and provide to TCEQ-TMDL if it makes the first cut for FY07 319 funding. |
| **Provision c.7.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that priority consideration should be given for the development of WPPs in watersheds containing Category 5(c) impairments where a TMDL has not been initiated. In this way, progress towards achieving water quality standards is initiated even before a TMDL is established. |
| **Activities:**<br>• The list of 5c water bodies in the draft 2006 303(d) List was presented at the meeting by TCEQ-SWQM.<br>• TSSWCB identified a proposal to develop a WPP in the Lampasas River watershed above Stillhouse Hollow reservoir |

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| received in response to their solicitation for their 2007 319 grant projects. This water body is a category 5(c) listing for bacteria in the draft 2006 303(d) List.<br>• TSSWCB advised TCEQ that a task in a contract with the Brazos River Authority to develop a WPP for the North Bosque River, including Goose Branch, will not be completed; no additional funding will be allocated to that project. |
| **Action Items:**<br>• TCEQ and TSSWCB will continue to participate in the state's 303(d) listing process.<br>• TSSWCB will review the proposal for developing a WPP in the Lampasas River watershed and will communicate with the TCEQ-319<br>• TCEQ will develop a strategy to address the impaired uses in Goose Branch |
| **Provision c.8.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that a WPP under development or implementation will not preclude the initiation, development, and establishment of a TMDL. |
| **Activities:**<br>• TMDL and WPP overlap in the Leon River watershed and possibly the Lower San Antonio River watershed.<br>• TCEQ discussed how it coordinated TMDL and WPP in the Upper San Antonio River watershed.<br>• EPA provided an overview of their review of WPPs and is currently reviewing the Arroyo Colorado and Upper San Antonio River WPPs that were completed. |
| **Action Items:**<br>• TSSWCB will provide clarification as to its plan to coordinate the development of a WPP in the Leon River watershed with the TMDL development project.<br>• TSSWCB will review the proposal for the Lower San Antonio River and communicate with the TCEQ.<br>• The agencies will consider the need for a statewide policy defining the relationship between I-Plans and WPPs. |
| **Provision c.9.** For projects that address agricultural and/or silvicultural nonpoint source pollution, both parties agree that the TCEQ has a legal responsibility to establish TMDLs in impaired water bodies and to do so in a timely manner. WPPs to address impairments on the 2006 and future 303(d) lists should be developed within six years after the impairment is listed to allow for the development of a TMDL within the mandated timeframe, should one be necessary. |
| **Activities:**<br>• At the Oct. 31st meeting, TCEQ described its management's directive to provide quarterly reports on the status of water quality impairments in Categories 5(a), (b), and (c). The reporting is a new mechanism to better track how impairments are being addressed with available resources in a timely manner. Although there wasn't time to discuss this at the March 29th meeting, the inclusion of the TSSWCB's projects in the TCEQ's database is a priority and needs to be followed up on. |

**Action Items:**

- The TCEQ will provide the database structure and instructions to the TSSWCB so the Board can provide information on their projects to be included in the TCEQ's CAT TRACK database.
- TSSWCB will provide project information for the CAT TRACK database.

Attachment 4

TSSWCB Priority List for TMDL Development and Implementation

# TCEQ and TSSWCB COORDINATION
# TMDL Development and Implementation

**June 22, 2007**

| TMDL Project Name | Phase | Segment Number | TMDL Adopted | TSSWCB Priority(1) |
|---|---|---|---|---|
| Aquilla - Atrazine | Imp | 1254 | 2001 | High |
| E.V. Spence - TDS | Imp | 1411 | 2001 | High |
| N Bosque River - Phosphorus | Imp | 1255, 1226 | 2001 | High |
| Lake O' the Pines - DO | I-Plan | 0403 | 2006 | High |
| Petronila Creek - Sulfate, Chloride, TDS | I-Plan | 2204 | 2007 | Low |
| Upper Colorado River Below E.V. Spence - Chloride, TDS | I-Plan | 1426 | 2007 | Low |
| Arroyo Colorado - DO II - Remodeling & Sampling | TMDL | 2201 | 2010 | High |
| Atascosa River - Bacteria | TMDL | 2107 | 2008 | High |
| Clear Creek Watershed - Bacteria | TMDL | 1101, 1101B, 1102, 1102A, 1102B, 2425C | 2008 | High |
| Copano Bay - Oyster Waters Bacteria | TMDL | 2472, 2001, 2003 | 2008 | High |
| Dickinson Bayou - DO | TMDL | 1103 | 2008 | High |
| Dickinson Bayou Watershed - Bacteria | TMDL | 1103, 1103A, 1103B, 1103C, 1103D, 1104 | 2011 | High |
| Elm & Sandies Creek - DO & Bacteria | TMDL | 1803A, 1803B | 2008 | High |
| Leon River - Bacteria | TMDL | 1221 | 2008 | High |
| Lower San Antonio River - Bacteria | TMDL | 1901 | 2008 | High |
| Orange County - Bacteria, DO, & pH | TMDL | 0508, 0508A, 0508B, 0508C, 0511, 0511A, 0511B, 0511C, 0511E | 2007 | High |
| Oso Bay - Bacteria | TMDL | 2485 | 2007 | High |
| Oso Creek - Bacteria | TMDL | 2485A | 2008 | High |
| Peach Creek - Bacteria | TMDL | 1803C | 2008 | High |
| Brays Bayou Watershed - Bacteria | TMDL | 1007B, 1007C, 1007E, 1007L, 1007P | 2010 | Low |
| Buffalo & Whiteoak Bayous - Bacteria | TMDL | 1013, 1013A, 1013C, 1014, 1014H, 1014K, 1014M, 1014N, 1014O, 1017, 1017A, 1017B, 1017D, 1017E | 2008 | Low |
| Eastern Houston - Bacteria | TMDL | 1006F, 1006H, 1007F, 1007G, 1007H, 1007I, 1007K, 1007M, 1007O, 1007R | 2010 | Low |
| Gilleland Creek - Bacteria | TMDL | 1428C | 2007 | Low |
| Greens Bayou Watershed - Bacteria | TMDL | 1016, 1016A, 1016B, 1016C, 1016D | 2010 | Low |
| Guadalupe Above Canyon - Bacteria | TMDL | 1806 | 2007 | Low |
| Halls Bayou Watershed - Bacteria | TMDL | 1006D, 1006E, 1006I, 1006J | 2010 | Low |
| Northwest Houston - Bacteria | TMDL | 1002, 1003, 1004, 1004D, 1004E, 1008, 1008B, 1008H, 1009, 1009C, 1009D, 1009E | 2012 | Low |
| Sims Bayou Watershed - Bacteria | TMDL | 1007D, 1007N, 1007Q | 2010 | Low |
| Trinity River - Bacteria | TMDL | 0805, 0806, 0841 | 2008 | Low |
| U Oyster Creek - Bacteria | TMDL | 1245 | 2007 | Low |
| U Oyster Creek - DO | TMDL | 1245 | 2008 | Low |
| Upper San Antonio River - Bacteria | TMDL | 1910, 1911, 1910A | 2007 | Low |
| Upper Texas Coast - Oyster Waters Bacteria | TMDL | 2421, 2422, 2423, 2424, 2432, 2439 | 2008 | Low |

Notes: (1) High Priority indicates projects which will go to the TSSWCB for formal concurrance. Low Priority indictates projects in which TSSWCB will participate, but which will not seek formal concurrance.

Attachment 5

List of active TSSWCB Clean Water Act §319(h) funded projects relating to the development or implementation of TMDLs

# *Active CWA Section 319(h) Projects*

| | *Project Name* | *Project Description* | *Lead* | *Period* | *Federal* |
|---|---|---|---|---|---|
| 01-17 | Extending TMDL Efforts in the NBR Watershed | This project will provide storm and routine monitoring of tributaries that contribute nonpoint source loadings to an impaired water body in order to assess agricultural NPS reductions. | TIAER | 3 /31/2006<br>3 /30/2008 | $441,755 |
| 01-19 | ENVIROCAST | The project Envirocast®: Increasing Nonpoint Source Pollution Prevention through Watershed Awareness in the Upper Trinity River Watershed will introduce environmental news and information at the local level specifically designed to raise citizen's understanding, appreciation, and treatment of environmental issues at the watershed scale. | NCTCOG | 3 /1 /2006<br>5 /1 /2007 | $390,000 |
| 01-22 | Improvement and Standardization of Laboratory Quality Assurance and Quality Control for Mehlich III Soil Test Methodology: Phase 1 | The objective of this project is to develop appropriate and standardized quality assurance/quality control and standard operating procedures (SOP) for use of the Mehlich III soil test extractant. | TCE | 9 /1 /2006<br>3 /1 /2008 | $228,097 |
| 02-11 | Phosphorus Index | The objectives of this project are to determine the effects of selected soil properties on measured and predicted P runoff, compare and correlate different soil test & soil solution extractable P levels to runoff P, and validate and/or modify the TX P Index as a predictive tool for classification of field sites relative to P loss potential. | TCE | 9 /27/2002<br>3 /31/2008 | $203,178 |
| 02-13 | Oso Creek/Oso Bay Watershed Implementation Assistance | This project will consist of TSSWCB working cooperatively with the Nueces SWCD #357 in the Oso Creek/Oso Bay Watershed to provide technical and financial assistance to landowners in the implementation of WQMPs. | Nueces SWCD & TAES AREC (CC) | 12/1 /2002<br>3 /31/2008 | $596,067 |
| 03-06 | E.V. Spence Saltcedar | This project will provide technical and financial assistance toward implementation of targeted brush control activities for the purpose of reducing NPS loadings from saltcedar in the E.V. Spence Reservoir. | TSSWCB | 11/1 /2003<br>3 /31/2008 | $2,208,446 |
| 03-10 | Technologies for Animal Waste Pollution | The objective of this project is to evaluate up to six technologies for decreasing nonpoint source pollution and improving surface water quality, through on-site demonstrations of reduction of total and soluble P in dairy effluent applied to waste application fields. | TWRI and TAMU-BAEN | 11/24/2003<br>3 /31/2008 | $227,793 |
| 03-11 | Leaf Beetle Demonstration | The project will demonstrate the usefulness of biologically treating saltcedar in the Colorado River Basin in an effort to reduce NPS pollution loadings resulting from saltcedar on agricultural lands. | ARS-USDA | 1 /15/2004<br>3 /31/2008 | $99,246 |

| Project Name | | Project Description | Lead | Period | Federal |
|---|---|---|---|---|---|
| 03-14 | Edge of Field Monitoring | The project will monitor and evaluate the P reduction capabilities of a state of the art methane digester installed on a dairy facility in the North Bosque River watershed operating in conjunction with a CNMP. | BRA & TIAER | 11/18/2003<br>1 /31/2008 | $96,081 |
| 04-03 | Athletic Field Topdressing as a Commercial Market for Compost from Dairy Manure (Field of Dreams Project) | The purpose of this project is to gain commercial acceptance of blend of compost and sand for topdressing of athletic fields through demonstration on athletic fields. | Leon-Bosque RC&D | 8 /4 /2004<br>7 /31/2007 | $300,000 |
| 04-04 | Field Validation of the Texas P Index in the Poultry Areas of Texas | The objectives of this project are to determine the effects of selected soil properties in Sam Rayburn Reservoir and Lake O' the Pines watersheds and other poultry producing areas of the state in East & South Central Texas to measure & predict P runoff and compare and correlate Mehlich III and soil solution soluble P extracts to runoff P. | TCE | 8 /18/2004<br>9 /30/2008 | $390,657 |
| 04-06 | Modeling Nutrient Loads from Poultry Operations in the Toledo Bend & Sam Rayburn Reservoir Watersheds | This project will simulate nutrient loadings for pre and post implementation conditions in the Toledo Bend Reservoir and Sam Rayburn Reservoir watersheds. | USDA NRCS-WRAT | 4 /11/2005<br>3 /31/2008 | $96,000 |
| 04-10 | Phytoremediation of excessively high phosphorus soils and subsequent reduced P runoff into North Bosque River | The objective of this project is to develop and demonstrate year-round forage systems for both abandoned and currently used waste application fields that can reduce P loads that soon will or already exceeds safe levels of plant-available P on the North Bosque River drainage. | TAES - Stephenville | 8 /30/2004<br>8 /31/2008 | $238,859 |
| 04-12 | Assessment of Springtime Contributions of Nutrients and Bacteria to the NBR | This project will provide storm and routine monitoring of tributaries to the NBR in order to assess ag NPS reductions. The project will focus on springtime contributions of nutrients and bacteria to water quality within tributaries of the NBR, assessing reductions in pre- and post-TMDL implementation periods. | TIAER | 8 /15/2004<br>8 /31/2008 | $90,090 |
| 04-14 | Assessment and Mitigation of Agricultural and Other NPS Activities in the Cypress Creek Basin. | The primary goal of the project is to evaluate the effectiveness of selected BMPs in reducing nutrient inputs to Big Cypress Creek and Lake O' Pines by documenting runoff quality from sites representing dominant soil & land use types, with/out BMPs. | NETMWD | 8 /3 /2004<br>3 /31/2008 | $442,805 |

| Project Name | | Project Description | Lead | Period | Federal |
|---|---|---|---|---|---|
| 04-15 | Mathematical Model for Dispersal of Leaf Beetle, Diorhabda Elongata from Old World released in U.S. for Biological Control of Invasive Saltcedar | The goal of the project is to aid in the Implementation Plan for Sulfate and Total Dissolved Solids (TMDLs) in the J.B. Thomas, E.V. Spence and O.H. Ivey Reservoirs by biological control of saltcedar in riparian areas along the Colorado River of Texas and its tributaries. | ARS-USDA | 10/27/2004<br>8 /31/2007 | $136,724 |
| 04-19 | Regional Watershed Coordinator | The objective of this project is to successfully facilitate and coordinate watershed planning activities in the Wharton Regional Office service area. | TSSWCB | 8 /31/2007 | $145,249 |
| 05-04 | Silvicultural NPS Abatement | This project will reduce significant risks to water quality from silvicultural NPS pollution by implementing BMPs and increasing silvicultural NPS awareness by completing a statewide evaluation of silvicultural BMP implementation, providing technical assistance, education, coordination, and monitoring the effectiveness of forestry BMPs. | TFS | 9 /1 /2005<br>8 /31/2008 | $574,521 |
| 05-05 | Watershed Education | The purpose of this project will be to develop and deliver an educational curriculum which functions to support the TSSWCB's effort to prepare a Watershed Protection Plan in the target watershed. | TCE | 9 /1 /2005<br>8 /31/2008 | $358,041 |
| 05-06 | PLAN | The objective of this project is to educate 3rd party applicators of poultry litter to the environmental benefits of using proper application management techniques on new sites. | TCE | 9 /1 /2005<br>8 /31/2008 | $210,002 |
| 05-07 | Impact of Proper Fertilizer Management | The objective of this project is to implement fertilizer management practices on cultivated and pasture fields to demonstrate the importance of using proper management relating to application method, timing, and rate, and conduct demonstration/educational activities on the importance of proper organic fertilizer management. | TCE | 9 /1 /2005<br>8 /31/2008 | $186,352 |
| 05-08 | Peach Creek Project | This project will provide agricultural producers in the Peach Creek watershed with an opportunity to participate in water quality educational activities, technical assistance, and financial assistance for the implementation of Best Management Practices (BMPs), in order to improve water quality. | Gonzales SWCD | 9 /1 /2005<br>8 /31/2008 | $465,123 |
| 05-10 | Arroyo Eduation Project | The purpose of this project is to educate agricultural producers on how to better produce and manage their acreage and support and promote associated programs implementing BMPs related to water quality protection. | TWRI | 9 /1 /2005<br>8 /31/2008 | $103,959 |

| Project Name | | Project Description | Lead | Period | Federal |
|---|---|---|---|---|---|
| 05-12 | Arroyo WQMP Project | This project will provide technical assistance to landowners to aid in the development and implementation of a minimum of 78 WQMPs in the Arroyo Colorado Watershed. | Hidalgo & Southmost SWCDs | 9 /1 /2005<br>8 /31/2008 | $970,478 |
| 05-13 | Composting Support - DMES | The project consists of the TSSWCB working cooperatively with participating entities, dairy producers, manure haulers, and others in the Bosque and Leon River watersheds to provide financial assistance to manure haulers in the creation and removal of a marketable-composted product. | TSSWCB | 9 /1 /2005<br>9 /30/2007 | $228,000 |
| 06-04 | Improvement and Standardization of Laboratory Quality Assurance and Quality Control for Mehlich III Soil Test Methodology: Phase 2 | The purpose of this project is to develop appropriate and standardized quality assurance/quality control and standard operating procedures (SOP) for use of the Mehlich III soil test extractant. | TCE | 10/1 /2006<br>9 /30/2009 | $100,786 |
| 06-05 | Lone Star Healthy Streams | This project will reduce the levels of bacterial contamination of Texas watersheds from grazing livestock (beef cattle) by developing an educational curriculum that delivers current knowledge training in production and environmental management of grazing lands and their associated watersheds, evaluating and demonstrating the effectiveness of BMPs in reducing bacterial contamination of streams and water bodies from grazing lands, testing the functionality of the education program and make necessary changes and program modifications based on the results, and promoting Statewide adoption of appropriate best management practices (BMPs) and other watershed / water quality protection activities through education, outreach and technology transfer. | TWRI | 10/1 /2006<br>9 /30/2009 | $404,673 |
| 06-06 | Envirocast Phase II | The principal goal of e-Life is to continue developing public understanding and awareness of watershed issues through environmental stories and features broadcasted during e-Life segments. The second phase will build upon the e-Life broadcasting platform and Web tools established during the first phase. By continually exposing the North Central Texas public to e-Life concepts, the project aims to help the public adopt NPS pollution prevention behaviors. | NCTCOG | 2 /1 /2007<br>4 /30/2008 | $272,785 |
| 06-07 | Monitoring and Educational Programs Focused on Escherichia coli Bacteria and Nutrient Runoff on Dairy Operations in the Leon Watershed | The objectives of this project are to evaluate the presence of E. coli bacteria and nutrients on livestock operations and determine the risks of movement of E. coli and nutrients to surface waters, educate livestock producers about best management practices to decrease E. coli bacteria and nutrients in runoff from livestock operations, and determine the source(s) of E. coli in runoff from the sites and its relative contribution to the E. coli populations downstream of the waste application fields. | TAES-Stephenville | 10/1 /2006<br>9 /30/2009 | $438,357 |

| Project Name | Project Description | Lead | Period | Federal |
|---|---|---|---|---|
| 06-08 Education Program for Improved Water Quality in Copano Bay | The objective of this project is to improve the water quality in Copano Bay and its tributaries by increasing awareness of the water quality issues throughout the watershed and providing education and demonstrations for landowners and livestock owners in the watershed on practices to decrease or prevent bacteria from entering waterways. | TWRI | 10/1 /2006<br>9 /30/2009 | $211,794 |
| 06-10 Arroyo Colorado Agricultural Nonpoint Source Assessment | The objectives of the project are to perform a complete historical data review and analysis related to water quality and agricultural best management practices implemented in the watershed, investigate site-specific differences and temporal variation of water quality in drainage from agricultural production areas, and collect data for future recalibration of SWAT model to better estimate the total nonpoint source loading into the river. | TWRI | 10/1 /2006<br>9 /30/2009 | $430,650 |
| 06-12 Leon River WPP | The objectives of this project are to use a locally-driven, stakeholder process to develop a Watershed Protection Plan for the Leon River Watershed above Lake Belton; enhance data collection efforts to support and facilitate implementation activities; provide the TSSWCB and the TCEQ with recommendations on implementation strategies that can be incorporated into the TMDL Implementation Plan; and provide an overall assessment of the Leon River Watershed above Lake Belton. | BRA | 10/1 /2006<br>9 /30/2009 | $440,525 |
| 06-13 Three EQIP Technicians | The objective of the project is to provide technical assistance to landowners to aid in the development, implementation, and/or maintenance of WQMPs through SB503, Clean Water Act (CWA) Section 319(h) and EQIP funds and compile information on the location and types BMPs for each WQMP implemented. | Karnes, Atascosa, & Dewitt SWCDs | 12/1 /2006<br>9 /30/2009 | $387,900 |
| 06-15 SWQM for Copano Bay TMDL | The objective of this project is to provide quality assured surface water quality monitoring data to support development of bacteria TMDLs for Copano Bay and Mission and Aransas Rivers in Aransas, Bee, Goliad, Karnes, Refugio, and San Patricio Counties. | NRA | 1 /1 /2007<br>9 /30/2009 | $214,388 |

Attachment 6

*TSSWCB Policy on TMDLs* approved May 24, 2007

# TEXAS STATE SOIL AND WATER CONSERVATION BOARD

## Policy on Total Maximum Daily Loads

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Being designated as the lead agency in this state for activity relating to abating agricultural and silvicultural nonpoint source pollution, and being responsible for planning, implementing, and managing programs and practices for abating agricultural and silvicultural nonpoint source pollution, it the policy of the Texas State Soil and Water Conservation Board (TSSWCB) to administer a Total Maximum Daily Load (TMDL) Program.

Further, it is the policy of the TSSWCB that the TMDL Program be administered in a manner consistent with Texas Agriculture Code §201.026, the *State of Texas Nonpoint Source Management Program*, *Guidelines for the Award of Clean Water Act – Section 319 Nonpoint Source Grants to States and Territories*, the *TSSWCB Quality Management Plan for Environmental Data Collection Activities* and the *Memorandum of Agreement (MOA) on Total Maximum Daily Loads, Implementation Plans, and Watershed Protection Plans* between the TSSWCB and the Texas Commission on Environmental Quality (TCEQ).

The TSSWCB will only participate in the development and implementation of TMDLs that contain or are suspected to contain an agricultural or silvicultural nonpoint source component. Staff of the TSSWCB will work through local soil and water conservation districts to ensure agricultural producers and landowners are adequately represented as stakeholders during all phases of TMDL development and implementation.

Staff of the TSSWCB will maintain a list of TMDLs in which agency resources are committed. Pursuant to §b.6 of the MOA, the Staff of the TSSWCB will bring all TMDLs and TMDL Implementation Plans that seek to attain or maintain water quality standards through load allocation of or strategies to control agricultural or silvicultural nonpoint source pollution to the TSSWCB for consideration of approval.

Whenever possible, any state funding appropriated to the TSSWCB for the TMDL Program will be used to match federal funding. The TSSWCB authorizes the Executive Director to apply state appropriated funding for:

- grants that further TMDL development and implementation through water quality monitoring, modeling, bacterial source tracking, planning and demonstration, implementation, education, and research projects,
- direct administrative costs for administering the TMDL Program, and
- indirect administrative costs.

The TSSWCB authorizes the Executive Director to establish a deadline within each fiscal year by which the Staff of the TSSWCB will obligate through contract any state appropriated funding for grants. Staff of the TSSWCB will notify the TSSWCB as obligations are made at regularly scheduled State Board meetings. All other state appropriated funding for TMDLs will be expended through the agency operating budget.

Attachment 7

List of Expert Advisors to the Task Force on Bacteria TMDLs

# Appendix 1: Bacteria TMDL Task Force Members and Expert Advisors

## *Members*

| | |
|---|---|
| Allan Jones (Chair) | Texas Water Resources Institute |
| George Di Giovanni | Texas Agricultural Experiment Station – El Paso |
| Larry Hauck | Texas Institute for Applied Environmental Research |
| Joanna Mott | Texas A&M University – Corpus Christi |
| Hanadi Rifai | University of Houston |
| Raghavan Srinivasan | Texas A&M University – Spatial Sciences Laboratory |
| George Ward | University of Texas at Austin |

## *Expert Advisors*

| | |
|---|---|
| Linda Brookins | TCEQ |
| Faith Hambleton | TCEQ |
| Jim Davenport | TCEQ |
| Patrick Roques | TCEQ |
| Andrew Sullivan | TCEQ |
| Tom Weber | TCEQ |
| John Foster | TSSWCB |
| Aaron Wendt | TSSWCB |
| Patricia Radloff | TPWD |
| Duane Schlitter | TPWD |
| Dave Sager | TPWD |
| Monica Kingsley | DSHS |
| Kirk Wiles | DSHS |
| Richard Eyster | TDA |
| David Villarreal | TDA |
| Tiffany Morgan | BRA |
| Dave Bass | LCRA |
| Ned Meister | Texas Farm Bureau |
| John Barrett | Agriculture Producer / Landowner |
| John Blount | Harris County |
| Greg Rothe | San Antonio River Authority |
| Wiley Stem | City of Waco |
| Rene D. Massengale | Baylor University |
| Fred Cox | Hamilton County Judge |
| Dickie Clary | Hamilton County Commissioner |
| Tom Edrington | USDA – Agricultural Research Service |
| Randy Rush | USEPA – Region 6 – NPS Grants |
| Shawneille Campbell | USEPA – Region 6 – TMDL Program |

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| Mike Schaub | USEPA – Region 6 – Ecosystems Branch |
| Bob Joseph | USGS – Texas |
| Don Stoeckel | USGS |
| Myron Hess | Environmental Groups (National Wildlife Federation) |
| Mel Vargas | Consulting Firms (Parsons) |
| David Harkins | Consulting Firms (Espey) |
| James Miertschin | Consulting Firms (JMA) |
| Michael Bloom | Consulting Firms (PBS&J) |
| Terry Gentry | TAMU – Soil & Crop Sciences |
| Mark McFarland | TAMU – Soil & Crop Sciences |
| Bruce Lesikar | TAMU – Biological and Agricultural Engineering |
| Patty Haan Smith | TAMU – Biological and Agriculture Engineering |
| Yongheng Huang | TAMU – Biological and Agriculture Engineering |
| R. Karthikeyan | TAMU – Biological and Agriculture Engineering |
| Binayak Mohanty | TAMU – Biological and Agriculture Engineering |
| Clyde Munster | TAMU – Biological and Agriculture Engineering |
| David Maidment | UT at Austin – Center for Research in Water Resources |
| Richard Hay | TAMU – Corpus Christi – Center for Water Supply Studies |

## *Agency Staff*

| | |
|---|---|
| Ashley Wadick | TCEQ |
| Betsy Chapman | TCEQ |
| Jason Skaggs | TCEQ |
| Greg Merrell | TCEQ |
| Linda Brookins | TCEQ |
| Tom Weber | TCEQ |
| Elaine Lucas | TCEQ |
| John Foster | TSSWCB |
| Kevin Wagner | TWRI |
| Rosemary Payton | TWRI |
| Kathy Wythe | TWRI |

Attachment 8

Excerpts from 4th draft (June 4, 2007) of the *Bacteria TMDL Task Force Report*, including the Executive Summary, Table 1, Table 2 and Figure 5

# Bacteria Total Maximum Daily Load

# Task Force Report

**Fourth Draft**

**June 4, 2007**

**Prepared for:**

Texas Commission on Environmental Quality

and

Texas State Soil and Water Conservation Board

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# Executive Summary

In September 2006, the Texas Commission on Environmental Quality (TCEQ) and Texas State Soil and Water Conservation Board (TSSWCB) charged a seven-person Bacteria Total Maximum Daily Load (TMDL) Task Force with:

- examining approaches that other states use to develop and implement bacteria TMDLs,
- recommending cost-effective and time-efficient methods for developing TMDLs,
- recommending effective approaches for developing TMDL Implementation Plans (I-Plans),
- evaluating a variety of models and bacteria source tracking (BST) methods available for developing TMDLs and I-Plans, and recommending under what conditions certain methods are more appropriate, and
- developing a roadmap for further scientific research needed to reduce uncertainty about how bacteria behave under different water conditions in Texas.

The Task Force, assisted by an Expert Advisory Group of approximately 50 stakeholders and agency staff, held two two-hour meetings/teleconferences and developed two drafts of the report. These drafts were shared by e-mail and on a Web site and feedback received from the Expert Advisory Group was also made available on the Web site.

The Task Force report describes the characteristics, as well as some of the strengths and weaknesses of several models that have been used and/or are under development to assist bacteria TMDL and I-Plan analysis. These include:

- load duration curves (LDC),
- spatially explicit statistical models, including Arc Hydro, SPARROW and SELECT,
- the mass balance models BLEST and BIT, and
- the mechanistic hydrologic/water quality models HSPF, SWAT, SWMM and WASP.

The Task Force report also describes and makes recommendations for effective use of BST methods that have been used in Texas and elsewhere for TMDL development. These include ERIC-PCR, Ribotyping, PFGE, KB-ARA, CSU and *Bacteroidales* PCR. Based on recent experience in Texas and elsewhere, the Task Force recommends using library-independent methods like *Bacteriodales* PCR for preliminary qualitative analyses and more expensive and time-consuming library-dependent methods if more quantitative data are required for TMDL or I-Plan development.

Based on the discussions of bacteria models and source tracking, as well as extensive input from the Expert Advisory Group, the Task Force recommends a three-tier approach to implementing bacteria TMDLs and I-Plans.

Tier 1 is a one-year process that includes the formation of a representative stakeholder group, development of a comprehensive geographic information system (GIS) of the watershed, a survey of potential bacterial sources, calculation of load duration curves from existing monitoring data and analysis by agency personnel and stakeholders of data collected for Tier 1. After reviewing information from Tier 1, the group may choose to complete and submit a draft TMDL for agency approval, request an evaluation of the designated use of the water body (an use attainability analysis) or proceed to Tier 2.

Tier 2 is a one-to-two-year effort designed to collect targeted monitoring data to fill gaps in previously collected data, conduct qualitative library-independent BST data to determine whether humans and/or a few major classes of animals are sources and develop simple spatially explicit or mass balance models of bacteria in the watershed. After analysis of Tier 1 and Tier 2 data, the group may chose to complete and submit the draft TMDL (or I-Plan if a TMDL was developed after Tier 1), request an evaluation of the designated use (an use attainability analysis), or initiate a "phased TMDL" and proceed with Tier 3 analysis.

Tier 3 is a two-to-three-year process designed to continue strong stakeholder involvement, implement more extensive targeted monitoring, conduct quantitative

library-dependent BST analysis and develop a detailed hydrologic/water quality model for the watershed. Tier 3 should be implemented only when this level of detailed analysis is needed for I-Plan development or for TMDL development for particularly complex watersheds for which consensus cannot be reached after Tier 2.

The Task Force emphasizes that the agencies and stakeholders may choose to deviate from these recommendations if they reach consensus that a more time- and cost-effective approach is feasible.

The Task Force concludes its report by summarizing a number of research activities needed to strengthen the scientific tools available for TMDL and I-Plan development. The needed research falls into the following categories: characterization of sources, characterization of kinetic rates and transport mechanisms, enhancements to bacteria fate and transport models and bacteria source tracking, determination of effectiveness of control mechanisms and quantification of uncertainty and risk.

Finally, the report includes a number of references to relevant scientific literature and studies, as well as five appendices:

| | |
|---|---|
| Appendix 1 | Bacteria TMDL Task Force Members and Expert Advisors |
| Appendix 2 | Models Used in Bacteria TMDLs as Described in EPA Publications |
| Appendix 3 | EPA Bacteria TMDL Guidelines |
| Appendix 4 | State Approaches to Bacteria TMDLs |
| Appendix 5 | Comments from the Expert Advisory Group |

# Table 1 Bacteria Modeling Matrix

| Model | | LDC | Spatial Explicit Statistical Models | | | Mass Balance Models | | | Mechanistic/Hydrologic/WQ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ArcHydro | SPARROW | SELECT | BLEST | BSLC | BIT | HSPF | SWAT | SWMM | WASP |
| Watercourse Type | Watersheds | | x | x | x | x | x | x | x | x | x | |
| | River/Stream | x | x | x | x | x | x | x | x | x | | x |
| | Lake/Reservoir | | x | x | x | x | x | x | | | | x |
| | Fresh/Saltwater Estuarine | | x | x | x | x | x | x | | | | x |
| TMDL Phase | Development | x | x | x | x | x | x | x | x | x | | x |
| | Implementation | | x | | | x | | | x | x | | x |
| Model Type | Analytical | x | x | x | x | x | x | x | | | | |
| | Numerical | | | | | | | | x | x | x | x |
| Spatial Dimensions | 1-D | | | x | x | | | | x | x | x | x |
| | 2-D | | | | | | | | | | | x |
| | 3-D | | | | | | | | | | | x |
| Time Scale | Steady-state | | | x | | | | | | x | | x |
| | Time Varying | | | | | | | | x | x | x | x |
| | Single Storm Event | | | | x | | | | x | x | x | |
| | Continuous in time | | | x | | | | | x | x | x | x |
| Watershed Characteristics | Rural | x | x | x | x | x | x | x | x | x | | |
| | Urban | x | x | x | x | x | x | x | x | x | x | |
| | Sediment transport | | | x | x | | | | x | x | | x |
| In-Stream Processes | Bacteria Regrowth | | | | | | | | | | | |
| | Bacteria Die-off | | | x | | | | | x | x | | |
| | Settling | | | | | | | | x | x | | |
| | Re-suspension | | | | | x | | | x | x | | |
| WLA Sources | WWTF | | | x | x | x | | | x | x | | x |
| | Storm Sewers | | | x | x | x | | | x | x | | x |
| LA Sources | Septic Tanks | | | x | x | x | x | x | x | x | | |
| | Direct Deposition | | | | | x | x | x | x | x | | x |
| | Bed Sediment | | | | | x | | | x | | | x |
| Cost | | $ | $$ | | | $$ | | | $$$ | | | |

Notes: 1. Shaded areas: not applicable.

# Table 2. Relative comparison of several bacterial source tracking techniques

| Technique | Acronym | Target organism(s) | Basis of characterization | Previously Used or in Progress in Texas | Used in other states | Accuracy of source identification | Size of library needed for water isolate IDs | Capital cost | Cost per sample (reagents and consumables only) | Ease of use | Hands on processing time for 32*** isolates | Time required to complete processing 32 isolates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Enterobacterial repetitive intergenic consensus sequence polymerase chain reaction | ERIC-PCR | *Escherichia coli* (*E. coli*) and *Enterococcus* spp. | DNA fingerprint | Yes (Di Giovanni) | Yes | Moderate | Moderate | $20,000 ($15,000 BioNumerics software, $5,000 equipment) | $8 | Moderate | 3 h | 24 h** |
| Automated ribotyping (RiboPrinting)† | RP | *E. coli* and *Enterococcus* spp. | DNA fingerprint | Yes (Di Giovanni) | Yes | Moderate | Moderate | $115,000 ($100K RiboPrinter, $15K BioNumerics software) | $40 | Easy | 1 h | 24 h |
| Pulsed field gel electrophoresis | PFGE | *E. coli* and *Enterococcus* spp. | DNA fingerprint | Yes (Pillai and Lehman) | Yes | High | Large | $30,000 | $40 | Difficult | 10 h | 5 days |
| Kirby-Bauer antibiotic resistance analysis‡ | KB-ARA | *E. coli* and *Enterococcus* spp. | Phenotypic fingerprint | Yes (Mott) | Yes | Moderate* | Moderate | $35,000 | $15 | Easy | 3 h | 24 h** |
| Carbon source utilization | CSU | *E. coli* and *Enterococcus* spp. | Phenotypic fingerprint | Yes (Mott) | Yes | Moderate | Moderate | $15,000 | $10 | Easy | 4 h | 24 h** |
| *Bacteriodales* polymerase chain reaction | *Bacterio-dales* PCR | *Bacteriodales* species | Genetic marker presence or absence (not quantitative) | Yes (Di Giovanni) | Yes | Moderate to high for only human, ruminant, horse, and pig sources | Not applicable | $5,000 | $8 | Easy to moderate | 3 h | 8 h** |
| *Enterococcus faecium* surface protein polymerase chain reaction or colony hyb. | *E. faecium* esp marker | *E. faecium* | Genetic marker presence or absence (not quantitative) | Yes (Di Giovanni) | Yes | High for only human | Not applicable | $8,000 | $8 to $12 | Easy to moderate | 3 to 6 h | 8 to 24 h** |
| ERIC and RP 2-method composite | ERIC-RP | *E. coli* | DNA fingerprints | Yes (Di Giovanni) | No | Moderate to high | Moderate | $120,000 | $48 | Moderate | 4 h | 24 h |
| ERIC and KB-ARA 2-method composite | ERIC-ARA | *E. coli* | DNA and phenotypic fingerprints | Yes (Di Giovanni) | No | Moderate to high | Moderate | $55,000 | $23 | Moderate | 6 h | 24 h |
| KB-ARA and CSU 2-method composite | ARA-CSU | *E. coli* and *Enterococcus* spp. | Phenotypic fingerprints | Yes (Mott) | Yes | Moderate to high | Moderate | $50,000 | $23 | Easy to moderate | 7 h | 24 h |

†A manual ribotyping version is also used by some investigators (i.e. Dr. M. Samadpour with IEH Laboratories and Consulting Group in Seattle), but no detailed information is available for comparison.
‡A variation of this technique using replica plating and +/- scoring of growth on media with different concentrations of antibiotics, called ARA, has been used extensively in Virginia for TMDLs.
*This technique is better for distinguishing broader groups of pollution sources. For example, "wildlife" and "livestock" as opposed to "avian wildlife", "non-avian wildlife," "cattle," etc.
**With sufficient personnel, up to approximately 150 isolates can be analyzed in 24 h.
***Thirty two isolates selected for comparison because it is the maximum throughput per day of the RiboPrinter, which is the only automated system described.

authority to develop an initial outreach strategy whereby agency representatives will solicit the commitment and involvement at the local level of key leaders.

**Figure 5: Recommended Three-Tier Approach for Bacteria TMDL Development**

**<u>Tier 1 Analysis (T1)</u> (one-year)**
**Required for all bacteria TMDLs.**

1. Form TMDL stakeholder advisory group.
2. Develop comprehensive GIS inventory for watershed.
3. Implement source survey for watershed.
4. Calculate load duration curves (LDCs).
5. Analyze Tier 1 data with stakeholder advisory group.

*Decision 1 (D1)* *Are data and analysis adequate?*
Yes → Go to D2.
No → Go to T2.

*Decision 2 (D2)* *Are needed load reductions socially and economically attainable?*
Yes → Complete and submit draft TMDL for agency approval.
No → Complete and submit a draft TMDL that includes a recommended change in designated use (i.e. Use Attainability Analysis).

**<u>Tier 2 Analysis (T2)</u> (one-to-two years)_**
**Implemented for most bacteria TMDLs. May be adequate for I-Plan development for non-controversial TMDLs.**

1. Implement targeted monitoring to fill data gaps.
2. Perform library-independent BST and limited library-dependent BST analysis.
3. Develop simple LDC, GIS and/or Mass Balance Models.
4. Analyze Tier 2 data with stakeholder advisory group.

*Decision 3 (D3)* *Are data and analysis adequate?*
Yes → Go to D4.
No → Initiate a "phased TMDL" and go to T3.

*Decision 4 (D4)* *Are needed load reductions socially and economically attainable?*
Yes → Complete and submit draft TMDL (or I-Plan) for agency approval.
No → Complete and submit a draft TMDL that includes a recommended change in designated use (i.e. Use Attainability Analysis).

**<u>Tier 3 Analysis (T3)</u> (two-to-three years)**
**Normally used for I-Plan development. May be required for development of complex "phased TMDLs."**

1. Assure extensive stakeholder involvement.
2. Implement extensive targeted monitoring.
3. Perform extensive library-dependent BST analysis.
4. Complete mechanistic modeling.
5. Analyze Tier 3 data with stakeholder advisory group.

*Decision 5 (D5)* *Are needed load reductions socially and economically attainable?*
Yes → Complete and submit draft I-Plan (or revise "phased TMDL") for agency approval.
No → Complete and submit a draft TMDL that includes a recommended change in designated use (i.e. Use Attainability Analysis).

Attachment 9

Summary of the May 16, 2007 meeting of TCEQ's Surface Water Quality Standards Advisory Workgroup

# Workgroup II – May 16, 2007
# Summary

**Comments**:
1. Areas below dams can be lower in DO than the segment criteria because of bottom releases. Should these areas be considered mixing zones? LCRA
2. Should TCEQ consider seasonal uses for chronic toxic criteria in streams like they do for other constituents? Example intermittent streams.
3. Since TCEQ is considering using a tissue based number for mercury, they should also consider using a tissue based number for all the other toxics in the standards that bioaccumulate. Lial Tischler

**Recreational uses and criteria**

General comments:
- Standards are not for monitoring "swimming areas." It would be useful to keep them separate.
- Care should be taken in depending on recreational and bacteria studies because they were either done in northern waters or in California. They may not be representative of Texas waters.
- Even though these studies may not be directly applicable to Texas, there are no studies in Texas and they are better than nothing. Risk levels should not be lowered. There is not sufficient data to indicate that they should be.
- Regrowth should be considered.
- Alternative options suggested would be to define recreational uses as per the activity, ex. Swimming, wading, boating, etc. Scale the criteria to water ingestion risk or immersion risk. Also consider the frequency of use, ex. public vs. private and seasonal variations. Private and seasonal would not be protected at as high a level.

**Questions**
1. Should a broader range of recreational uses be considered?

Option 1: No changes to 2000 recreational uses and criteria. *All groups agreed that there needed to be some changes.*

Option 2: Separate contact recreation into primary and secondary and keep noncontact recreational use. *One group suggested a multimatrix structure considering depth, flow, and season. There are problems with the administration and assessment of this approach. One group agreed that there needed to be more categories.*

Option 3: Have two types of primary contact recreation water (class 1A and 1B), secondary contact recreation and noncontact recreation. *This option is difficult.*

*One group discussed that with multiple uses, look at most protective/stringent use, perhaps use a factor of 10 for different uses. For example, boating = X, fishing = 10X, wading = 100X, swimming = 1000X. Questions were asked such as: Will the*

*categorization be based on real data (studies) or be anecdotal? Should some type of study be done, as is for WERs? Though not necessarily a full TMDL. The problem is defining use, e.g., kayakers, but not swimmers with HFEC, since kayakers aren't expected to ingest water. Uses could be grouped by ingestion rates. Flexibility is key, the more options the better. Option 2 less challenging than 3. The options should be done incrementally. This group wasn't sure if there ever would be enough data to implement this option. It would required UAAs to get to secondary from primary? UAA without accounting for downstream use?*

*Another group was split on which option was most favorable. They agreed that there should be different standards for different risks, and that there needed to be studies and good data. They liked the multiple standards idea with a UAA to change the use.*

*One group suggested a 4th option that uses be grouped by ingestion rates.*

*Another group discussion revealed that some felt that the uses are subjective and that the data was not available to subdivide into categories. The lack of data is a problem and there may need for a broad based study; however, a study of that nature may not be possible. The risks and levels of bacteria are unknown in a lot of areas. Some other questions that arose in the group were: What is the background of streams, such as high flow events, especially since "Not every water is swimable." For those unswimable streams how do we protect the public? Put up signs or fence off everything? This was thought to not be possible or effective. The bacteria document does not make suggestions about ingestion. The group suggested using a 100ml ingestion event? Should there be wording such as "For uses that are attainable <18in deep normal flow." You can distinguish a water body to be not head immersion, but less than full body. There should be recognition of different levels of contact recreation.*

*One issue mentioned is the Houston Ship channel example, which has a site specific standard of incidental ingestion. Can you adjust the risk level proportionally?*

*Is it possible to recognize potential exposure and reduce it by 10 or some other risk calculation? There needs to be well defined goals for appropriate contact recreation. What about different uses at different times of year? How do you clarify a person getting their feet wet to get in a canoe, or children having their face in the water and putting their hands in their mouths.*

*Can there be a footnote for more than 3 categories? Can uses specific to that stream be considered? Overall one group voted for option 2 and 3. Some thought option 2 would be more feasible and cleaner than option 3. Option 3 would require study. UAAs were also believed to be necessary to determine anything other than PCR.*

2. What are the appropriate risk levels for the different recreational use options listed in question 1? Consider that they should be protective of human health and downstream uses. *One group discussed that it comes down to, "How many people are allowed to get sick?" 1%? Should the risk level be the same for all types of uses? Does the risk of getting sick outweigh other risks during high flows, such as drowning or getting hit by floating debris? The group felt hamstrung by limited data and uncertainty. They felt that there needed to be more epidemiological studies. Another group indicated that the risk levels were fine and that the risks could be less stringent if the incidence of immersion was lower than predicted. Noncontact recreation (NCR) wouldn't particularly make the*

*criteria less stringent. For high flow, such data shouldn't be assessed, or a different use could be considered. One group suggested that noncontact recreation could be applied, but that additional data would need to be collected. Another group agreed and added that ingestion risk could be extrapolated from the 1984 studies. Also that NCR and secondary risk levels did not have to be set at the same level. One group suggested that all risk levels be set to 10. This would be the default. Studies would be needed to change it.*

*It appeared to the group that secondary was the same as NCR risk levels. It was pointed out that there are 7-8 ship channels currently and Rio Blanca, do other places need NCR? There was a suggestion that local input would be needed to determine reasonable distances downstream and that in general, risk levels should be a local decision. As far as protecting a water body, having a sign up doesn't mean people won't swim. Again it was questioned whether the secondary risk level was the same as NCR. Can there be different access periods? There was a suggestion to vote for different numbers for NCR and secondary (605 or 630). A statement was made that the number is based on ingestion risk. Also it was suggested that criteria be scaled based on risk.*

3. Nonhuman sources of bacteria

a. Can and should the water quality standards address situations where nonhuman sources of bacteria are known to be prevalent? *One group indicated Yes, but...are non-human bacteria less susceptible to cause illness to humans? What level of risk to human illness are non-human sources? If the answer is not known, how can the question be answered? If not addressed in standards (WQS), where should it be addressed? One group suggested that these sources could be addressed through TMDLs, permitting, as well as standards. This group suggested that the risk be addressed in WQS, but in a general sense. Possibly provide a site specific variance that would be addressed in the IPs? They had no suggestions for how this would be done. Another group agreed that nonhuman sources should be addressed, but only after demonstrations and studies.*

*One group suggested that risk levels could be looked at based on a percentage of bacteria. This use could be used for wildlife management areas or be site-specific criteria and uses.*

*For areas heavily used by wildlife the risk levels could be refined and be site-specific.*

3.b. Should TCEQ consider designating less stringent recreational categories for limited areas where wildlife sources of bacteria are unavoidably high, such as in wildlife preserves with very large waterfowl populations and limited aquatic recreational potential? *Goes back to the use...yes, but with caution. See notes in 3.a.*

3.c. Are there other ways in which TCEQ should address bacterial source tracking data? *One group questioned what is the appropriate goal? Could it be used as part of other data? One group encouraged its use, but indicated that more experience using it was needed. One group stated that more information was necessary on how they would be evaluated and applied. One group was fine with using BST data. Is there anything other than BST? Ultimately no. The Rio Blanca example was brought up.*

*In another group, the whole group voted yes for a). For b) There should be consideration of human diseases from non human sources. A statement was made that in the implementation of BST, it must define a standard procedure for the state that can be*

*modified with more information as it becomes available. They said as a caveat to (a) that a defined, accepted procedure be established for (c) before taking on (a). There was a concern for the term "souly" being used for non-human sources. The group also questioned how to adjust the criteria to human exposure?*

4. Options for assigning recreation uses for freshwater water bodies where uses are presumed.

Option 1: Should TCEQ continue to assume contact recreation for all unclassified water bodies? Why or Why not? *No, not if we don't know, but the default should be for the majority. The group also said yes, but there should be a clear road map provided so that it could be changed to other uses. UAAs submitted for approval. One group listed why not: there would be recreational restrictions, it would apply to small or shallow intermittent streams, it would be hard to change to a more appropriate use in the future. Their why change it covered: assume that the water bodies were contact recreation until an assessment was done. They also supported a presumption if there was an assessment that would lead to a change. One group indicated that there should be no blanket number.*

*One group member commented that concrete lined channels are not wading streams. Barton Creek was used as an example. For example, when Barton Creek has water in it people swim; however, the creek is unclassified. Therefore it was suggested that when there is a permit action on a stream or assessment it is advised to get local knowledge. Initially set it up as secondary. It may be possible to pull RWAs to determine use along with local entities. There could also be studies done. The consensus was no.*

Option 2: Should TCEQ consider applying secondary contact recreation to unclassified intermittent streams? Why or why not: *One group decided: Intermittent with pools - secondary contact recreation. Intermittent without pools - contact recreation. One group suggested that secondary recreation criteria and use could be applied as appropriate. Secondary could apply to intermittent or small unclassified streams, but that seasonal uses ex. Swimming holes, would have to be protected. Local knowledge would have to be used to support the use.*

*One group wondered about other unclassified streams.*

Option 3: Are there additional options that can be developed in coordination with the workgroup that should be evaluated?

5. Should the freshwater single sample numbers for *E. coli* be updated and if so how?

d. Options for contact recreation or primary contact recreation. *One group indicated that both state, regional, and local data should be used to recalculate the numbers. Another group agreed with using a state data set. For secondary, if EPA considers it necessary, the state data set would apply and would better characterize the state instead of what EPA had based their numbers on. They also questioned if there needed to be a secondary or NCR single sample number.*

i. Use newly collected state data to calculate a new standard deviation based on 82% moderate use. 82% was used to calculate single sample numbers in the 2000 TSWQS. *One group's input: Don't use single sample.*

*Calculate new SD for moderate use using state data? One group agreed with this option.*

ii. Use EPA's single sample values based on different levels of recreational usage

*One group's suggestions 75th for a beach, 385 (new) vs. 394 (current)and 82nd for moderate us, 489 (new) vs. 394 (current). Another group suggested selecting 1 % or the 90th percentile. With an assessment then you could pick 82-89 %.*

e.. Options for secondary contact recreation and noncontact recreation

i. Use newly collected state data to calculate a new standard deviation based on 82% moderate use. *One group suggested: Yes and add to IPs. One group asked what was the point of having a single sample criteria. There was a proposal for the removal of the single sample.*

*There were QA concerns. There were some explanations about the differences in the single samples vs. criteria and that single samples don't exceed the geomean of all values. There was concern expressed about sample sites not being randomly selected; therefore creating bias.*

**Standards Assessment/Attainment** questions

1. What are the groups' thoughts on revising the low-flow exemptions for the following criteria that are expressed as long-term averages so that the criteria apply at all flow conditions. And why?

*One group didn't think it was necessary for bacteria, but might be appropriate for TDS and toxics. Another group felt that many streams and swimming holes needed to be protected. This group felt that all the data should be used in an assessment. Other groups felt there were pros and cons to expanding the exemptions. One group felt that there was no reason to keep the exemption. Some in the group were opposed. There should be guidance in the IPs. For recreation, if the geomean was used for assessment the low flow would not be represented because the stream would be too shallow to sample and characterize. One group suggested including all the data for TDS and flow weight it. Human health exemption was fine. For recreation, the geomean was appropriate with a 7Q2 cut off where immersion was not practical. Then all the data could be used. But they were aware that there were assessment problems. One of the other groups supported different uses applying at different conditions.*

*For TDS in streams, one group had no concerns with including low-flow data as a long-term average as long as the monitoring data wasn't weighted to low-flow conditions (more data collected at the stations in the summer as opposed to the rest of the year). One member of the group did point out that this may discourage water reuse as it would tend to be more stringent. They were also alright with doing this for toxic criteria and recreational criteria (unless we develop a low-flow cut off for recreational uses).*

a. How would the group suggest addressing instances of zero stream flow?

*One group was not sure what to respond. When flow slowed on a perennial stream to pools because of drought or other reasons the samples would not be representative of the water body. They suggested keeping the exemption. One group had no real opinion/answer for zero flow. One group was in favor of not having an exemption at zero stream flow.*

2. High flow conditions

What about exempting some recreational criteria at high flow conditions?

*The high flow exemption topic was focused exclusively on recreational criteria and bacteria data. The summaries coming out of the break-out group discussions were somewhat varied. One group was for working for an exemption for all recreational uses on all streams and rivers, but not reservoirs but acknowledged that it would be difficult to set the high-flow benchmark for the entire state and recommended a more regional approach. Questions arose as to how to define high flow and how to assess them. It would be hard to include variables in a "representative" sample on a statewide basis. It would need to be done on a river basin scale and include velocity, depth, and rainfall. Another group agreed that velocity and depth were better to measure than "stage". One group stated that kayaking should be protected at the higher flows. They suggested that the sampling authority should be the one to determine when to monitor and the quality of the samples and if it was dangerous or not. They suggested a percentile basis of exemption with a bench mark documented in the IPs and site-specific. They indicated that "representative" sample was a work in progress and that the sampler should be the one making the decision. Another group suggested that there be flow velocity profiles for a water body and a point indicated as to when a person would be swept away. A "representative" sample could be one above the velocity profile. These values would not be used in assessment. One group discussed whether there should be an exemption if it rains at all (since storm water isn't treated)? Must tie the criteria to use, where flows are high enough to preclude the designated use?*

*Another group could not reach consensus. Some folks suggested using velocity as opposed to flow to develop exemptions (like the velocity it takes to sweep away a toddler), but others in the group pointed out that this may be the ideal velocities for kayakers. One idea was to incorporate some sort of depth/velocity approach (i.e., determine when flows get "dangerous" based on individual stream characteristics)*

*One of the groups suggested that a high-flow benchmark could be established on a percentile basis and should be placed in the monitoring guidance and not the standards. The last group was in favor of a high-flow exemption for all recreational criteria and suggested using some sort of flow/velocity profile or a straight 95th percentile to set the benchmark*

3. Which averaging statistics (mean or median) are most appropriate for determining compliance with a given criteria in the following contexts and why? What averaging period is most appropriate?

*Most groups agreed that the geomean was appropriate, even though one group had different opinions. The concern was that POTW's do not typically do an analysis to get a geomean. One group indicated that the geomean should be used only for contact*

*recreation designated waters. One group wanted to keep the single sample value but did not want to use it as the primary indicator for assessments. Another group wanted to keep the single sample maximum for wastewater permitting and swimmer notice. They suggested that intent and purpose language needed to be included. Another group wanted to also keep the single sample for notification but pointed out the delay in getting the information out to the public because of the time it takes to run the tests. They suggested that for 303d waters that a wastewater treatment plant analyze for E. coli for compliance and that it be used for setting TMDLs. One group wanted to see analysis of how many water bodies are listed for bacteria based on single sample vs. geo mean criteria. One group mentioned providing language in the standards that clarifies the role/responsibility of those collecting bacteria single samples from a water body in terms of the potential ramifications of reporting the results.*

# Surface Water Quality Standards Advisory Workgroup
# Attendee List
# May 16, 2007

| | |
|---|---|
| Nicole Coss | Port of Houston Authority |
| Mel Vargas | Parsons |
| Larry Hauck | TIAER |
| Charles Maguire | TCEQ |
| Michael Bloom | PBS&J/TXDOT Houston |
| Tony Bennett | TCB |
| Pat Radloff | TPWD |
| John Payne | SRA |
| Jay Bragg | BRA |
| Tony Smith | Espey Consultants |
| Tom Weber | TCEQ |
| Dan Obenour | JMA |
| Vickie Reat | TCEQ/Remediation Division |
| Lauren Kalisek | Lloyd Gosselink |
| Donna Long | TSSWCB |
| Randy Palachek | Parsons |
| Justin Bower | City of Sugar Land |
| Richard Eyster | TDA |
| Jason Leifester | TCEQ |
| Alicia Reinmund | LCRA |
| Marc Friberg | TCEQ |
| Mark Fisher | TCEQ |
| Sara Burgin | Baker Botts |
| Karen Holligan | TCEQ |
| Elaine Darby | QEA |
| Mary Etter | LCRA |
| Allison Jenkins | TCEQ |
| Patricia Wise | TCEQ |
| Webster Mangham | TRA |
| Jennifer Dorsey | CDM |
| Mark Lowry | TCB |
| Diane Evans | EPA |
| Kevin Wagner | TWRI |
| Carol Batterton | WEAT |
| Mark Ernst | TRWD |
| Linda Broach | TCEQ |
| James Ivy | Houston Arboretum |
| Alisa Max | Harris County |
| Trent Martin | Harris County |
| Bob Stokes | Galveston Bay Foundation |
| Laurie Curra | TCEQ |
| Peggy Glass | APAI |

| | |
|---|---|
| Carol Ellinger | City of Houston |
| Ceil Price | City of Houston |
| L'Oreal Stepney | TCEQ |
| Clyde Bohmfalk | TCEQ |
| Ed Peacock | City of Austin |
| Nancy Vignali | TCEQ |
| Kenda Smith | TCEQ |
| Kevin Phillips | Eastman Chemical Co. |
| Miles Hall | SRA |
| Ned Meister | Texas Farm Bureau |
| Mike Morrison | Freese & Nichols |
| Norm King | TXDOT |
| Lial Tischler | Tischler/Kocurek TCC |
| Aaron Wendt | TSSWCB |
| Glenn Clingenpeel | TRA |
| Adam Smith | City of Sugar Land |
| Larry Koenig | TCEQ |
| Jennifer Elms | EHRA |
| Cindy Contreros | TPWD |
| Mike Compton | TCEQ |
| Tiffany Morgan | BRA |
| Kay Barnes | BRA |
| Ben Weinheimer | TCFA |
| Louis Brzuzy | Shell |
| Scot Sullivan | TxDot |
| Lauren Crawford | TML |
| John Cuddihee | Terracon |
| Roger Schenk | CDM |
| Myron Hess | NWF |
| Catherine Nash | NRCS |
| Debbie Magin | GBRA |
| Yuguin Yang | TWDB |
| David T. Villareal | TDA |
| Anne Rogers | TCEQ-SWQM |
| Lucas Gregory | TWRI |
| Eric Allmon | Caddo Lake Institute |
| Darrell Andrews | Tarrant Regional |
| Ken Kramer | Sierra Club |
| Todd Renaly | HGAC |
| Catherine Elliott | HCFCD |
| Allison Woodall | TCEQ |
| Patrick Roques | TCEQ |
| Jim Davenport | TCEQ |

Attachment 10

TCEQ staff Assessment of the Bacteria TMDL Task Force Report (May 29, 2007)

TASK FORCE REPORT for BACTERIA TMDLs
Assessment of the Report, May 29 2007

## Executive Summary

The Task Force provided the means for important dialogue among experts around the state. The Task Force's final draft report summarizes current scientific approaches to modeling and bacteria identification analysis and provides focused research needs. Their recommendations include a tiered approach to implementing bacteria TMDLs and I-Plans. The TMDL Program appreciates the efforts of the Task Force in their challenging job of evaluating the current state-of-the science in bacteria TMDLs.

- The time frames identified with each tier recommended in the Report may be difficult for the TMDL program to achieve because of cost and budget cycle constraints.
- The iterative tiered approach towards TMDL completions could affect our ability to project annual commitments and performance measures.
- Based on TMDL program experience, additional modeling and bacterial source tracking (BST) efforts often produce additional assumptions and uncertainty that are not offset by the additional information produced.
- The Report recommends a "phased" or "provisional" TMDL to be adopted in the interim period during which water quality standards are being addressed. A "final" TMDL based on the existing water quality standard is needed for EPA approval.

## Executive Director Recommendations

1. TMDL projects should be customized by TCEQ with early stakeholder involvement and coordination with TSSWCB, relative to watershed and source-specific factors. As stated in the Report, staff should be allowed some flexibility in implementing the Task Force recommendations, especially the tiered approach. The report should not be interpreted as a strict guidance document.

2. During an interim period in which the water quality standards are being reviewed, "final" TMDLs based on existing water quality standards for bacteria should be completed, with the understanding that a review of the water quality standards would be an integral component of implementation.

3. Staff should proceed with the twelve TMDLs that were slowed or stopped during the Task Force deliberations and initiate new bacteria TMDL projects for other water bodies on the 303(d) list.

## Background

As of May 2007, 197 water bodies in Texas are impaired because they did not meet bacteria criteria established by the state and EPA to protect either the contact recreation use or the oyster water use. Section 303(d) of the federal Clean Water Act requires that TCEQ complete Total Maximum Daily Loads (TMDLs) for these water bodies. Performance measures established in both the EPA and TCEQ strategic plans commit the agency to addressing these impairments within thirteen years after they were identified as being impaired. The vast majority of the impairments will be addressed by Commission adoption of TMDLs.

At the request of stakeholders, the TCEQ has adjusted the schedule for TMDL development for water bodies listed as bacteria-impaired in agriculture-dominated watersheds. The suspension of twelve TMDLs (either stopped or slowed) allowed time for the Task Force to evaluate procedures for development and implementation of TMDLs for bacterial impairments. Attachment 1 identifies the suspended TMDLs. The Task Force completed its evaluation and submitted a final draft of a report on January 25, 2007.

## Task Force Effort

The TCEQ Commissioners and the Texas State Soil and Water Conservation Board (TSSWCB) appointed a seven member Bacteria TMDL Task Force on September 27, 2006, and asked them to evaluate the following:

- examine approaches that other states use to develop and implement bacteria TMDLs,
- recommend cost-effective and time-efficient methods for developing TMDLs,
- recommend effective approaches for developing TMDL Implementation Plans (I-Plans),
- evaluate a variety of models and bacteria source tracking methods available for developing TMDLs and I-Plans, and recommend under what conditions certain methods were more appropriate, and
- develop a roadmap for further scientific research needed to reduce uncertainty about how bacteria behave under different water conditions in Texas.

Task Force Chairman, Dr. Allan Jones of the Texas Water Resources Institute, was joined by six task force members:
Dr. George DiGiovanni, Texas Agricultural Experiment Station-El Paso
Dr. Larry Hauck, Texas Institute for Applied Environmental Research
Dr. Joanna Mott, Texas A&M University-Corpus Christi
Dr. Hanadi Rifai, University of Houston
Dr. Raghavan Srinivasan, Texas A&M University
Dr. George Ward, The University of Texas at Austin

The Task Force was assisted by a diverse group of advisors with experience in bacteria-related issues. TCEQ participants serving as expert advisors to the Task Force

included Faith Hambleton, Andrew Sullivan, and Thomas Weber (Chief Engineer's Office); Dr. Jim Davenport (Office of Permitting, Remediation, and Registration); Linda Brookins and Dr. Patrick Roques (Office of Compliance and Enforcement).

In addition to providing background data and information to the Task Force, TCEQ provided feedback and comments on various drafts of the report. Additional comments on the January 25th draft are summarized below. The staff of the TCEQ who participated in the evaluation concur that the report produced by the Task Force provided a good overview and summary of:

•approaches used in other states to develop and implement TMDLs to address bacterial impairments,
•the variety of mathematical models available for development of TMDLs and I-Plans,
•available methods for bacterial identification and source tracking, and
•further research needed to reduce uncertainty about how bacteria behave under different water conditions in Texas.

## Issues Relating to Task Force Recommendations

Based on research and experience the TCEQ staff acquired over the past several years, there are some concerns with the portions of the Task Force Report relating to the discussion of cost-effective and time-efficient methods for developing TMDLs and effective approaches for developing TMDL I-Plans.

The Task Force recognized that no single process is appropriate for all bacteria impairments and proposed a tiered approach which focused on the development of a scientifically credible process and included strong stakeholder involvement. This approach provides a framework for the development of TMDLs and I-Plans and could be adapted and applied to the current program. Nonetheless, carrying out the recommended approach (Task Force Report, pages 36 – 50) raises a few issues that warrant agency consideration and focus:

1. The time frames assumed by the Task Force for each tier may be too short. The completion time of a tier would be affected by agency procurement deadlines and fiscal year cycles.

2. Forecasting TMDL completions may be difficult for the program due to the iterative approach described in the report. An effort under Tier 1 or 2 would be completed and stopped. Then, subsequent decisions on completing the TMDL or further work would be based upon the degree of stakeholder consensus and the load reduction estimated by the project assessment results. Thus, the majority of the TMDLs and I-Plans may be completed in accordance with the suggested Tier 3 approach.

3. The Report's discussion of the tiered approach implies that consensus and confidence will be gained moving through the tiers. However, in some instances, the TMDL Program has found that additional modeling and bacterial source

tracking efforts produce additional assumptions and uncertainty that is not offset by the additional information produced.

4. The recommendations for developing a "provisional" or "phased" TMDL do not indicate that such TMDLs would be "final" TMDLs. This is a concern because EPA (based upon the federal courts) only allows final TMDLs that set allocations based upon the established water quality standard. Anything other than a final TMDL would not likely be approved by EPA.

   Even if a provisional or phased TMDL were to include allocations that aim to meet the existing standard, the report recommends that the TCEQ and TSSWCB delay TMDL implementation efforts until a review of the standard is completed, approved, and a revised TMDL was adopted. That process could be a substantial period of time (possibly greater than five years).

5. Stakeholders may have differing opinions on how strictly the TCEQ should follow the recommendations of the Report.

**Discussion**

Currently, the program's approach for a TMDL project is decided up front with adequate stakeholder participation. An action plan is then developed to fit the complexity of the watershed sources, data, degree and magnitude of impairment, and the level of accuracy and refinement desired. When a lack of consensus on a project emerges or when there is high uncertainty in the initial assessment, additional efforts are typically undertaken to improve certainty. A decision to complete the TMDL is guided by stakeholder acceptance as well as the need to produce completed TMDLs that address the impairment. The pace of TMDL completions is established by the EPA and state Legislative Budget Board based upon the number of and age of each impairment. To date, the Commission has adopted TMDLs with allocations that vary in the level of certainty, based upon the modeling methods used, the degree of effort undertaken, and the complexity of the water body. . In 2007, staff began to bring forward bacteria TMDLs for approval. The number of bacteria impairments is growing, thus triggering a need for an increasing number of bacteria TMDLs.

The TCEQ has existing processes to subdivide the 303(d) List into categories (5(a), 5(b), and 5(c)). Instead of proceeding with a TMDL, some impairments are assigned for standards review and placed in Category 5(b). TCEQ needs procedures for how to develop site-specific recreational uses (uses with numerical bacteria criteria). These procedures are under development, but could take two years to develop and a few more years to implement for a particular water body.

In the interim, the TCEQ could complete final bacteria TMDLs and use an adaptive management and a phased approach towards TMDL implementation. In instances where the contact recreation use is questioned, the TCEQ could include a standards review as an integral component of implementation. In this manner, the TMDLs are completed to

satisfy state and EPA commitments and implementation efforts to reduce pollutant loads can readily begin. Phase 1 I-Plans can accomplish many short-term goals that would not unduly burden the regulated community; for instance, a focus on optimizing compliance with existing permit requirements.

The concern over the iterative tiered approach could be addressed if the project was customized to focus on the completion and adoption of a TMDL. Under the Task Force proposal, the time and cost to complete the processes of one tier and then to initiate and start an additional tier of work could be extensive. Therefore, savings should be possible if a project can include tasks selected from any of the three tiers.

**Bacteria TMDLs That Are Currently Suspended**

In order to make up for the time provided for the Task Force evaluation, to fulfill performance measure commitments, and ensure continued federal funding assistance, the TCEQ will need to implement a more aggressive schedule to address the water bodies with bacterial impairments. The compressed schedule is further exacerbated by the additional water bodies identified with bacterial impairments in the next 303(d) List expected during this fiscal year. Those twelve TMDLs which were slowed or stopped to allow time for the Task Force are consistent with the proposed procedures and assessment tasks described in the Task Force Report.

## ATTACHMENT 1

Bacteria TMDL Projects on hold pending Commission review and direction relative to the Task Force recommendations. These are TMDL projects with significant agricultural production and land use in the impaired watershed:

| Project/TMDL Name | # TMDLs | Constituent |
|---|---|---|
| Leon River below Lake Proctor | 1 | Bacteria |
| Peach Creek (tributary of Guadalupe River) | 1 | Bacteria |
| Lower San Antonio River | 1 | Bacteria |

Bacteria TMDL Projects with continued TMDL development, but where stakeholder meetings are being deferred until further direction is received:

| Project/TMDL Name | # TMDLs | Constituent |
|---|---|---|
| Upper Trinity River | 3 | Bacteria |
| Elm Creek and Sandies Creek (tributaries of Guadalupe River) | 2 | Bacteria |
| Atascosa River | 1 | Bacteria |
| Mission River, Aransas River, Copano Bay | 3 | Bacteria |